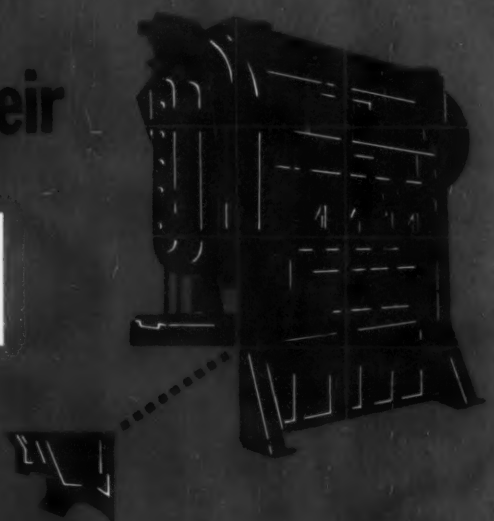
The IRON AGE

December 3, 1959 A Chilton Publication The National Metalworking Weekly

Special Survey for Management:

240 Companies Report on Their

DEPRECIATION METHODS



- The Rates They Use . . .
- The Changes They Want . . .
- Tax vs. Book Reporting . . .

QUESTION: Is Depreciation Reform Possible Next Year? – P. 81

Steel Strike Set Stage For Record Output in 1960 – P. 67

Raise Plant Capacity – P. 109

Digest of the Week – P. 2-3

Photograph courtesy of Pacific Forge, Inc., Fontana, Calif.

Of course Pacific Forge is fussy about surface condition

On drill bits for Security Engineering Division, Dresser Operations, Inc., Aristoloy round-cornered squares meet this forger's stringent requirements. In-plant scarfing and grinding prior to forging have been eliminated—rejects caused by surface defects have been reduced to a minimum.

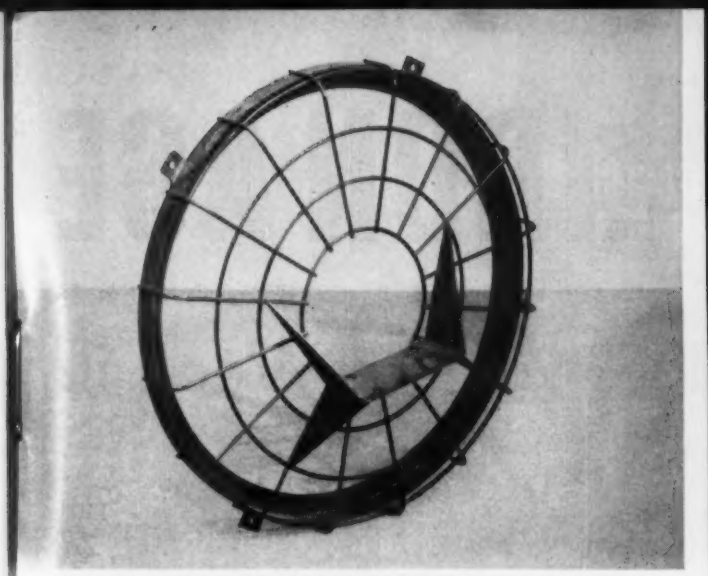
The secret—careful control of Aristoloy Steels from electric furnace melting to final rolling operations. The result—alloy steels of prime forging quality—and uniform chemical, structural, and hardenability characteristics that satisfy the critical use requirements for rock drill bits.

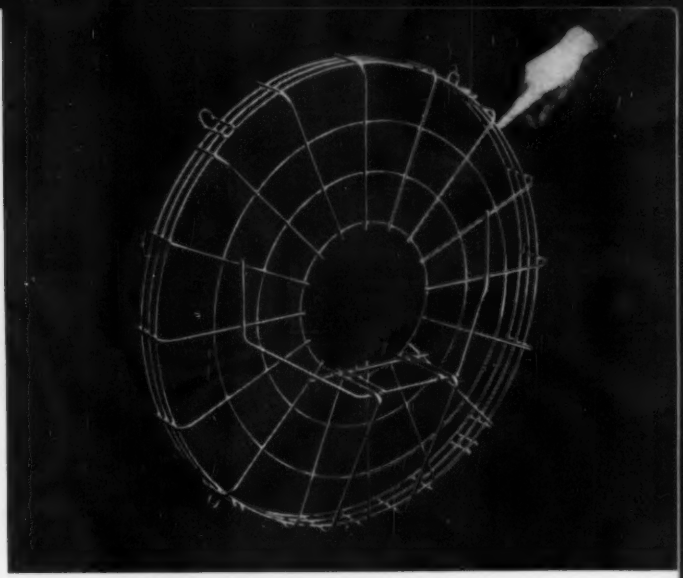
For complete information about Aristoloy structural alloy, stainless and carbon steels in leaded or standard analyses, contact the local Copperweld representative in your nearest large city. Or write for complete information.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

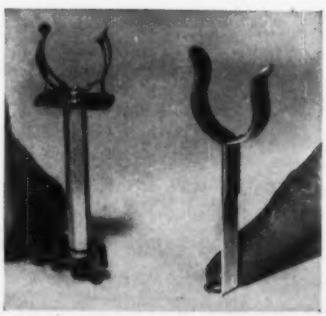
ARISTOLOY STEEL DIVISION • 4001 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.





MOTOR MOUNT AND GUARD for a transformer cooling fan. The all-wire piece, right, reduced cost to one third of former price, and weight from 24 lb to 13½ lb. The ¼-in. and 5/16-in. welded steel wire design, replacing the strip, wire frame, and cast rim assembly, also allowed closer tolerances.

How redesigning with steel wire



BRACKET to hold two-way radio plugs on chassis. Cost reduction was 75 pct and weight savings 50 pct when the complicated six-part assembly was eliminated. Manufacturing time of this simple, two-part, ⅜-in. x 1/16-in., flat steel wire design, right, was considerably reduced.

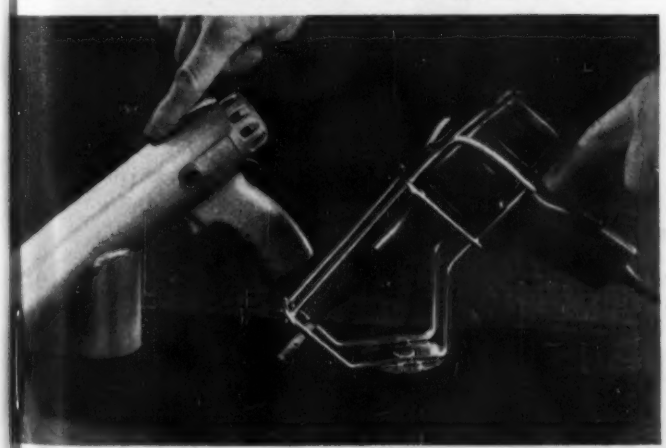
. . . cuts costs

. . . adds strength

. . . saves time

. . . reduces weight

HOLSTER for electric tool. The open wire frame reduced weight by 10 pct and cost by 66 pct. Replacing the welded tubing part, left, this steel wire assembly lends versatility in that it fits several types of tools.



These four examples show clearly why engineers and designers so frequently turn to steel wire for lower costs, simpler designs, and faster production.

Bethlehem makes wire for literally thousands of uses: upholstery spring wire, wire for cold-heading, wire for welded products, wire for handles, communications wire, etc. We regularly produce many grades of steel wire, with various coatings, processed in many ways to meet specific application requirements. Whether you need an ordinary or a special-purpose grade—our modern wire mills can produce it.

Our wire experts are at your service. A letter or call to your nearest Bethlehem sales office is all that's necessary.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

These case histories were furnished through the courtesy of E. H. Titchener and Co., Binghamton, N. Y., a regular user of Bethlehem wire.

BETHLEHEM STEEL

BETHLEHEM STEEL

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The IRON AGE

December 3, 1959—Vol. 184, No. 23

Digest of the Week in

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STEEL FORECAST

Record Coming — Pent-up demand following the 1959 strike will create a new steel production record next year. The total output may be as much as 10 pct higher then the old record set in 1955.

P. 67

RESEARCH SPENDING

More Dollars—Industry is plowing back more of every sales dollar into research and development.

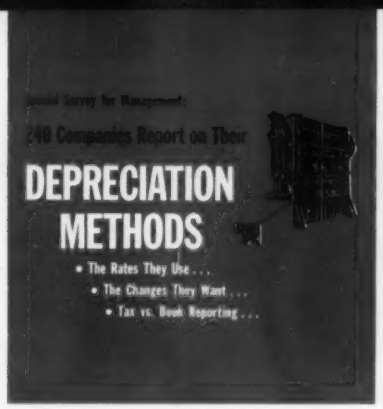
Right now emphasis is on materials research. Later it will shift to fabricating and development.

P. 70

WHITE COLLARS

Lead Job Outlook—Manufacturing industries were expected to absorb the largest group of new workers joining the expanding workforce during the 1955-1965 period. But manufacturing employment is barely holding its own.

Metalworking



◀ COVER FEATURE

DEPRECIATION SURVEY: This week's Special Report is based on a new survey of depreciation practices in metalworking. It includes methods used, what users want, and a report on obsolescence. It comes when tax problems are before Congress. P. 81

White collar and service jobs are providing today's employment opportunities. P. 72

FORECAST THE FUTURE

With Computers—Reducing company operations to a mathematical model and running it through a computer lets management choose the future it likes. P. 74

FEATURE ARTICLES

MORE PRODUCTION

From the Same Space—To keep pace with the coming metalworking boom, companies will either have to get more production out of the same floor space or expand physically. Here's a proven plan to achieve this goal without increasing plant size. The plan combines four basic steps. P. 109

SHAPING MAGNET CORES

With Adhesive Bonds—A huge electron accelerator at Harvard requires 612 magnet cores to form its controlled "electron orbit" system. A rubber-base phenolic resin is used to join 420,000 laminations, each less than 0.015 in. thick. P. 112

TWIN-DRIVE MOTORS

Check Downtime—In an effort to solve some of the maintenance problems in reversing mills, some design changes have been made on twin-drive motors. The new setup places the top motor forward over the extension shaft of the lower motor for easy access. P. 114

RELIEVE STRESSES

In Castings—A major company wanted to know how well its heat-treating practise relieved stresses in as-cast structures. Is it really worth the added expense? Stress analysis points up the answers. P. 116

LEADED STEELS

Apt to Fatigue?—Lead improves machinability of steels. But how are other properties affected? Here's some recent information on what lead does to fatigue limits of AISI 4340 steel, according to a university research team. P. 120

MARKETS & PRICES

NEW SUPERALLOY

From U. S. Steel—The Corporation has introduced Strux, which it says has about seven pct better strength-to-weight ratio than other constructional alloys. P. 69

STAINLESS STEEL

Selling at Retail — Producers of stainless have started a program to help department stores sell more stainless steel housewares. They reason that the more stainless products customers buy, the more they will sell. P. 73

STEEL SUMMARY

Defense Priorities—Defense industries are trying to cram up to six months of steel into the 80 days of the Taft-Hartley injunction. Amount of tonnage isn't clear, but some dislocations of alloy steel, structurals and plate have occurred. P. 153

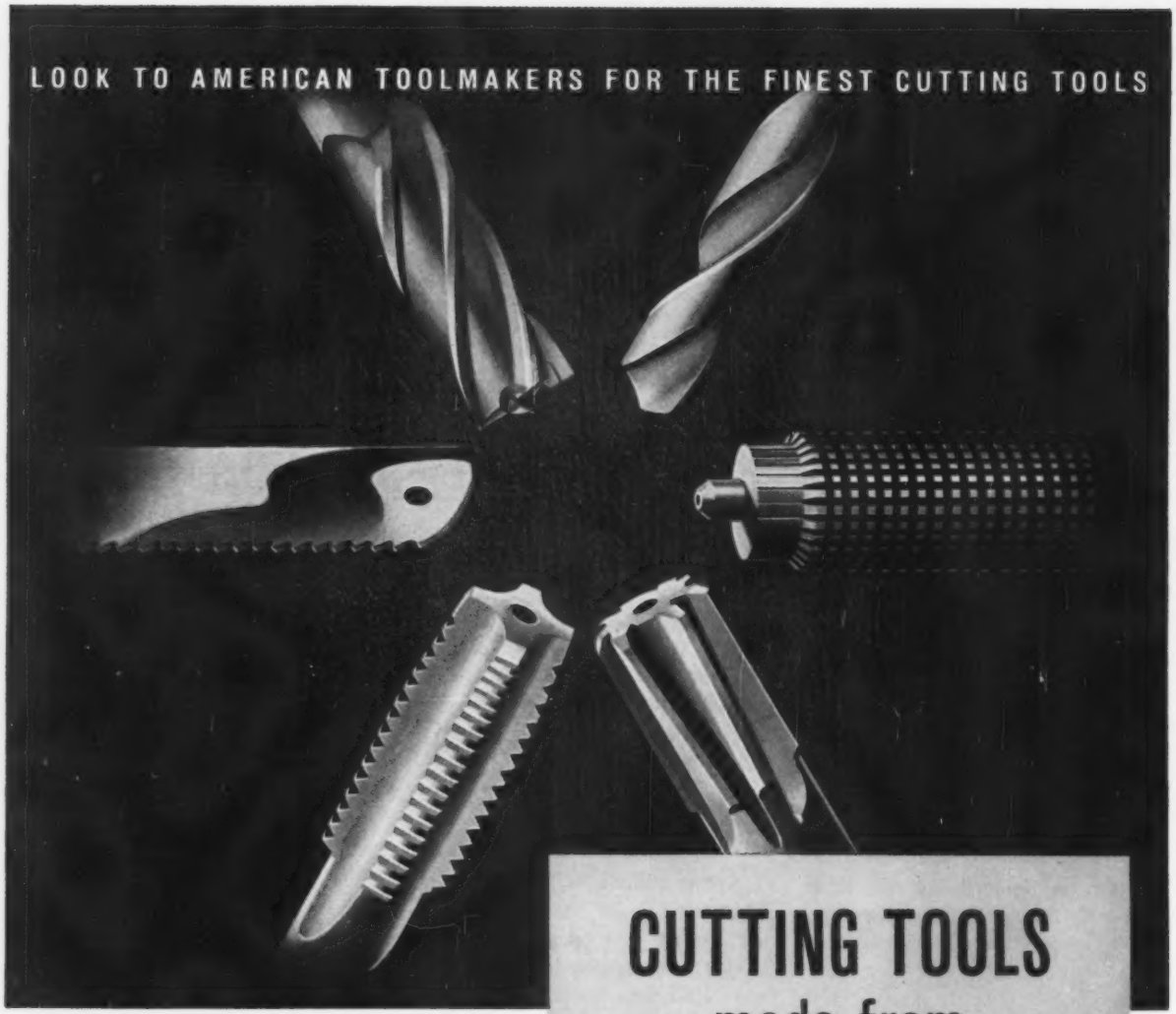
CONVEYOR DESIGN

Requires More Skill — More specialized talents are needed in conveyor design. It reflects the trend to greater automatic control, more continuous flow of materials. P. 154

NEXT WEEK

MAINTENANCE

Make It Effective—Next week's technical feature outlines ways to keep production equipment in top working order. Maintenance is the next subject in the prize-winning series, "How to Get More for Your Metalworking Dollar."



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Today's high speed steel tools for tapping, drilling, milling, broaching, reaming, sawing and other metal cutting operations are better than ever. Through research and development, and new and better production methods, American toolmakers are constantly improving high speed steel tools to help you make better products . . . at less cost.

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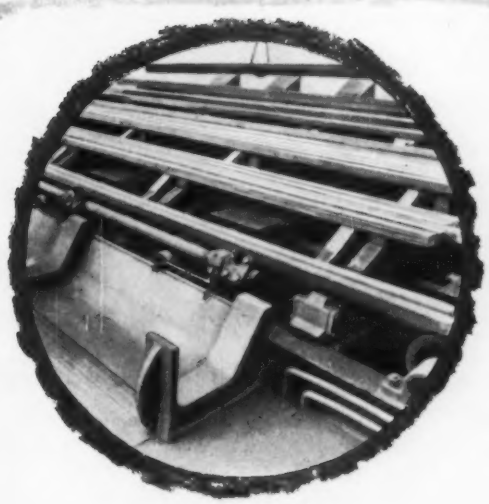
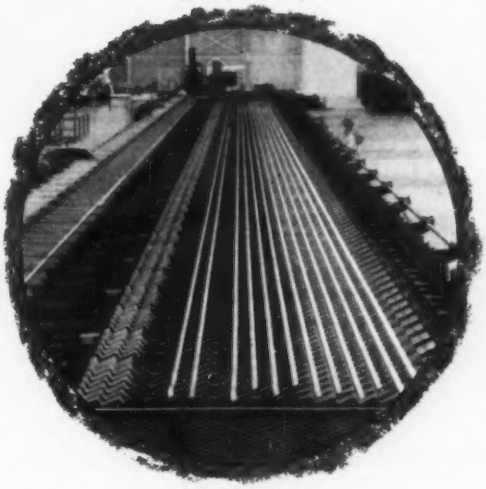


START



STOP

Morgan starts with the foundation and effectively covers every function of the mill from start to finish. Seventy years of experience in the rolling mill field have given Morgan a wealth of background and know-how without equal in quality and performance of mills.

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Late afternoon orders are often on their way at dawn from steel service centers of Armco Stainless Distributors. Such "first-thing-in-the-morning" service is possible because many truck loading operations take place while you sleep.

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What About Inflation? Yes, It's Still With Us!

The hard fight the steel industry is putting up by trying to make a dent in inflation is the best fight yet. But this is a big nation. And there are a lot of people and industries who don't want to put up such a fight.

In the past half year there have been many wage boosts and price increases. We are not licking the battle of inflation. Nor does it look as if we will. There are some who think the only way this will be done is through the wringer—otherwise known as a deep depression.

But anyone who went through the last big depression and saw the mental and spiritual anguish would hardly settle for that type of a cure—even if it were a cure.

Workers who see others getting a bigger paycheck figure they might as well get theirs too. It is only when we get to the age brackets close to pensions or to interest income—without escalation—that we go all out for anti-inflation fights.

It is being unrealistic to think that pamphlets, books, and slogans can do the right kind of a job. Maybe the President's idea of the cabinet level committee against inflation was a real starter. In the hands of people like Secretary of the Treasury Anderson and Vice President Nixon, we can be sure that an attempt will be made to put the story across.

But putting the story of inflation across to people who are young enough to think they are going up and up the ladder, that their credit is unlimited, and that the old folks "will be taken care of," is a tough job. It is hard to decide, or even suggest, who can do the selling.

So far, we have had phrases, slogans and speeches about the dangers of inflation. This, at a time when the safety of the dollar is at stake. This, at a time when extended credit is at an all-time high. This, at a time when another deficit looks certain. This, at a time when wage and price increases continue.

There can be only one answer. The story of inflation has to come from people who are known to have no axe to grind. To do that job there must be found the people who have neither riches nor poverty, neither political aims, union aims, management aims, nor delusions of grandeur.

In other words, we need dedicated people who know what they are talking about and what ought to be done. And then they must tell everyone what they know. That's the hardest job of all. Some day it has to be done.

Tom Campbell

Editor-in-Chief

New user reports say once again... rely on Ryerson for increased values

Here are new case histories that typify how thousands of steel and aluminum users who rely on Ryerson get *increased values* for their purchasing dollars. Individual points of difference between Ryerson and other sources may not in every case seem overwhelming—but in total they add up to an important difference in dependability, experience and capacity to serve.

Production up 30%. In the manufacture of this coupling, a large job shop recently switched from MT 1015 tubing to Ledloy® 170 tubing from Ryerson. Machining speed was stepped up to 170 sfm, and production increased 30%.

Emergency needs met. A breakdown was cutting output of a big paint producer, and the steel needed to repair the break was not available in the area. However, the required analyses and size were on hand at the nearest Ryerson plant 200 miles away —and within an hour Ryerson delivered 100 feet of this bar stock to the local airport. Three and a half hours after calling Ryerson in another state, the customer had his steel.

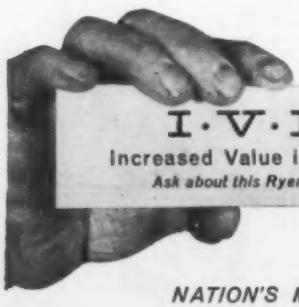
Aluminum key to low-cost production. Aluminum from Ryerson replaced chrome-plated brass on this hub for a disposable hypo needle—saving two-thirds of basic material cost plus elimination of expensive chrome plating. Machinability was equal to that of brass.

Switch to stainless doubles production of missile part. When this part was made of alloy steel, tolerances for threads and finish were not consistently held. And there were 25% rejects after plating. The solution came when specs were changed to free-machining Type 416 stainless from Ryerson. Plating was eliminated . . . production was doubled . . . thread tolerances were held . . . and the required finish was easily produced in milling operation.

Better product appearance and a worthwhile saving in material cost resulted when a Ryerson man recommended that a producer of portable coolers switch from one aluminum alloy (3003-H14) to another (5005-H14). Slightly higher structural strength was a bonus value. Unusually broad aluminum stocks and technical resources often enable Ryerson to serve in this way.

PVC cuts costs 50%. A screw machine shop recently replaced nylon with Ryertex®-Omicron PVC in the manufacture of a nipple adapter and coupling nut, and cut costs 50%. PVC machined better—to closer tolerances with improved finish . . . ran faster without "gumming." Note the perfect cutting of threads and barbs. Threads fit perfectly.

These examples illustrate some of the many advantages that make Ryerson service truly unique. A call to your Ryerson representative may solve similar problems for you.



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Ask about this Ryerson Plan for 1959

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Furnace-Sinter Tungsten

From Austria comes word of a new process for producing tungsten ingots. Rather than direct-sinter by passing an electrical current through a tungsten powder compact, the process sinters the compacts in large, high-temperature furnaces. A forging operation completes the cycle. Ingots weighing up to 200 lb have been produced.

Molybdenum for Hot Dies

Cast molybdenum dies are being considered for possible use in hot-die forming. This would be a step beyond the nickel base alloys already considered, and would allow theoretical die temperatures over 2000°F.

Use Over Wide Range

New strain gage minimizes apparent strain, caused by temperature change, when bonded to any one of a number of materials. Usually, temperature compensated strain gages have been manufactured for use on only one specific material. Moreover, the gage offers close compensation over a wide range, from —350° to +850°F.

Stainless Steel Powder

Corrosion-resistant parts are being made from a new stainless steel powder at a cost savings over cast and wrought stainless. One feature of the new powder is that it is not prealloyed. Even though structural shapes exceeding 95 pct of theoretical density can be produced, low compacting pressures are required.

Plan Tensile Microscope

Development of a microscope for continuous observation and filming of the surface of metallic specimens during mechanical testing is a project just placed with Comstock & Wescott, Inc. Specifications include provision for testing under extreme temperatures and in various environments. The microscope will be used to study deformation slip twinning, recrystallization, grain growth and transformation.

Lithium Stearate Lubricates

Recent research points out that substantially higher properties were obtained with sintered 70-30 brass compacts when lithium stearate was used as the lubricant, rather than the conventional lubricant. Preliminary studies show that property improvements can also be attained with the use of lithium stearate on copper and iron compacts.

Diamond Grit Dresser

Small diamond particles, cemented together by a powdered metal matrix, form a unique dressing tool for grinding wheels. As the metal matrix wears away, a fresh cutting edge of the impregnated diamond grit is constantly exposed. This insures a clean cut on grinding wheel face.

Ship in Fiber Drums

First shipments of products in new fiber drums are scheduled by the Dow Chemical Co. this month. The containers are described as "full-open head type lined with polyethylene-coated aluminum and liquid-tight bottom construction." Protection of product purity by eliminating dangers of contamination from iron, rust, or paint is an important advantage.

New Nickel-Steel Family

Development of a new family of high strength nickel alloy steels was confirmed by the International Nickel Co., Inc. Reported to contain 25 pct nickel, the steels can achieve high strengths by air cooling from heat treating temperatures. Other properties include: excellent cold formability, and weldability in hardened condition without preheat.

9 trouble-free years— still no trouble in sight

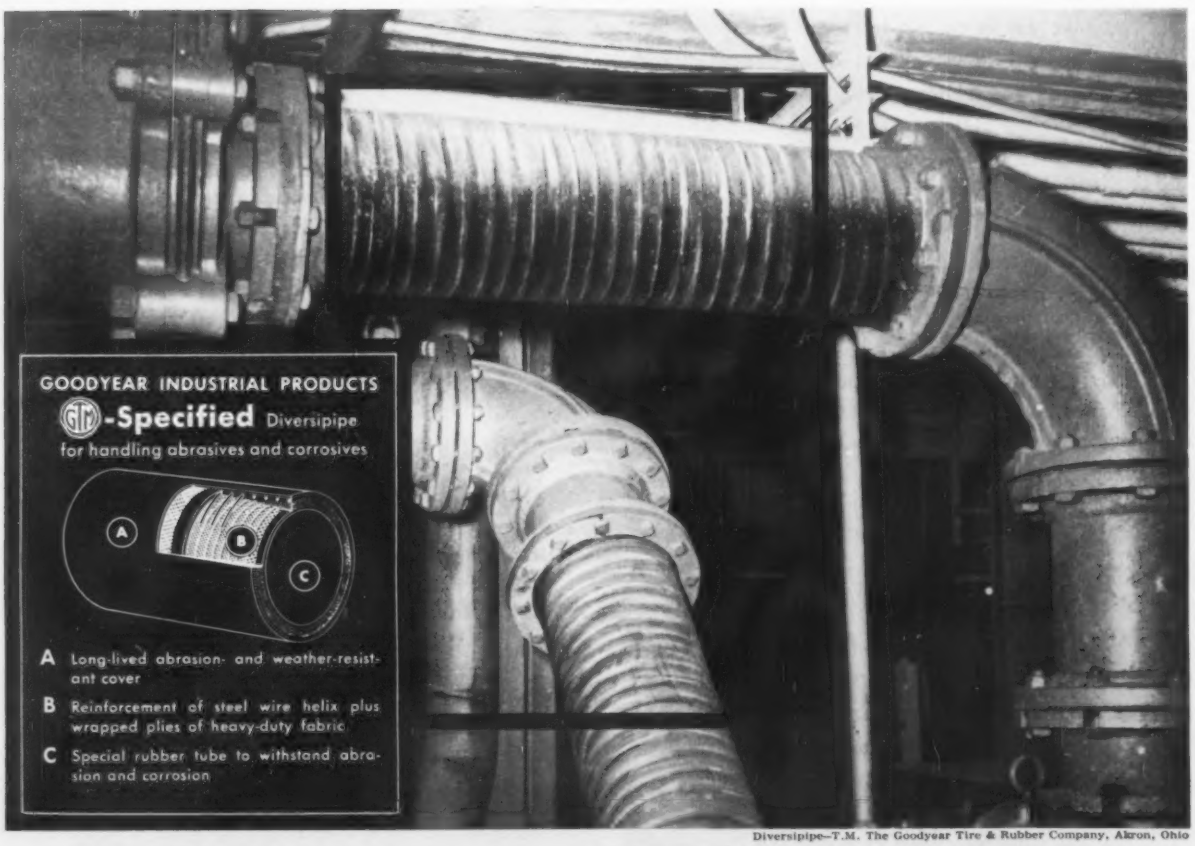
HANDLING the murderous abrasion of iron-ore slurry was only part of the problem when they added new facilities at this big Northeastern mine. There was also incessant vibration from pumps and refiners—certain to encourage leakage and shorten the life of just about any kind of slurry lines used.

But not if the lines were Diversipipe: recommended by the G.T.M.—Goodyear Technical Man. That super-tough rubber pipe fights off abrasion—absorbs shock. A bonus benefit: its flexibility makes intricate installations easier and less expensive.

At last report, the Diversipipe had been handling minus 14 mesh slurry—at 10 feet per second—for 9 straight, trouble-free years. And it's still giving like-new performance.

In fact, Diversipipe has proved the moneysaving answer to tough material-handling problems like this in many a plant. For expert tips on handling pumpable materials—especially abrasives or corrosives—check with the G.T.M. through your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*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for handling abrasives and corrosives
A
B
C
A Long-lived abrasion- and weather-resistant cover
B Reinforcement of steel wire helix plus wrapped plies of heavy-duty fabric
C Special rubber tube to withstand abrasion and corrosion

Diversipipe—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

DIVERSIPIPE BY

GOODYEAR

THE GREATEST NAME IN RUBBER

Save the Butter

Those TV commercials where the ball point pen tries to write through butter are old hat. As of now they can throw the butter out the window. It's won't be needed any more.

The reason? The Metallurgical Products Dept. of General Electric Co. has come up with a cemented carbide (trademarked Carboloy)

On glass, too.

which solves the problem of ball point skipping and sliding.

The cemented carbide, processed into tiny balls, lends itself well to the job of providing a long-lasting, skip-free ball point, GE says. About 50 million of them have already been produced.

So save your butter for the toast.

Boring from Within

Industry is trying to enlist a new ally in the drive for productivity: The housewife.

By getting the little woman into the act, business firms can step up employee productivity, a leading motivation consultant says. He's Lew Shalett, president of the Sheldon-Claire Co., Chicago.

Basic Need — "The desire for security is an essential part of a woman's emotional nature," says Mr. Shalett. "If management can show her the quality of performance by her husband and his co-workers contribute to that security, then it has taken a basic step in the direction of higher productivity."

As part of the program Mr. Shalett's company will send out a series of messages to housewives dealing with subjects ranging from the cost of groceries to economics. But the basic aim is selling the philosophy that her security is tied to increased industrial productivity.

So brace yourselves, men. Some evening when you get home, tired and weary, you may hear, "How was your productivity today at work, dear?"

Puzzler Answer

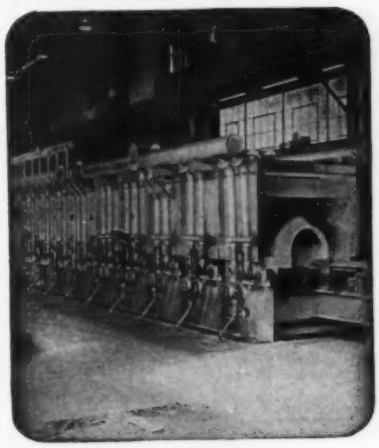
The solution to the Nov. 12 puzzler was easier than it looked. It took the horses two hours to get together so the bee flew 20 miles. So far we have heard from the following: Byron Mitchell, Metallurgist, Smith & Wesson; F. R. Bonner, U. S. Steel; Jesse Fleming, Blytheville Iron & Metal Co.; D. A. Watson, Metallizing Engineering Co.; Patric E. Simone, Jones & Laughlin, and E. V. Fanzoi, Republic Steel Corp.

Also, Arthur E. Frey, Colorado Fuel & Iron Corp.; Agnes A. Nelson, Muskegon Piston Ring Co.; John Lavan, General Motors; C. F. Hill, Lone Star Steel Co.; W. R. Moss, Chicago, Ill.; Mrs. Agnes Young, Morgan Engineering Co.; and old friend Jim Mull, The North American Manufacturing Co.—but, Jim, why do you say 40 miles?

New Puzzler

If Eustace gave Angus a mule, Angus would have twice as many mules as Eustace; or, if instead of that, Angus gave Eustace a mule, they would both have the same number of mules. How many did each have to begin with?

SPEED HEATING
SAVE SPACE
IMPROVE QUALITY
WITH HI-HEAD



R-S HI-HEAD HEATS 25 TONS SLAB PER HOUR . . 75% LESS FLOOR SPACE . . ONE FOURTH LABOR

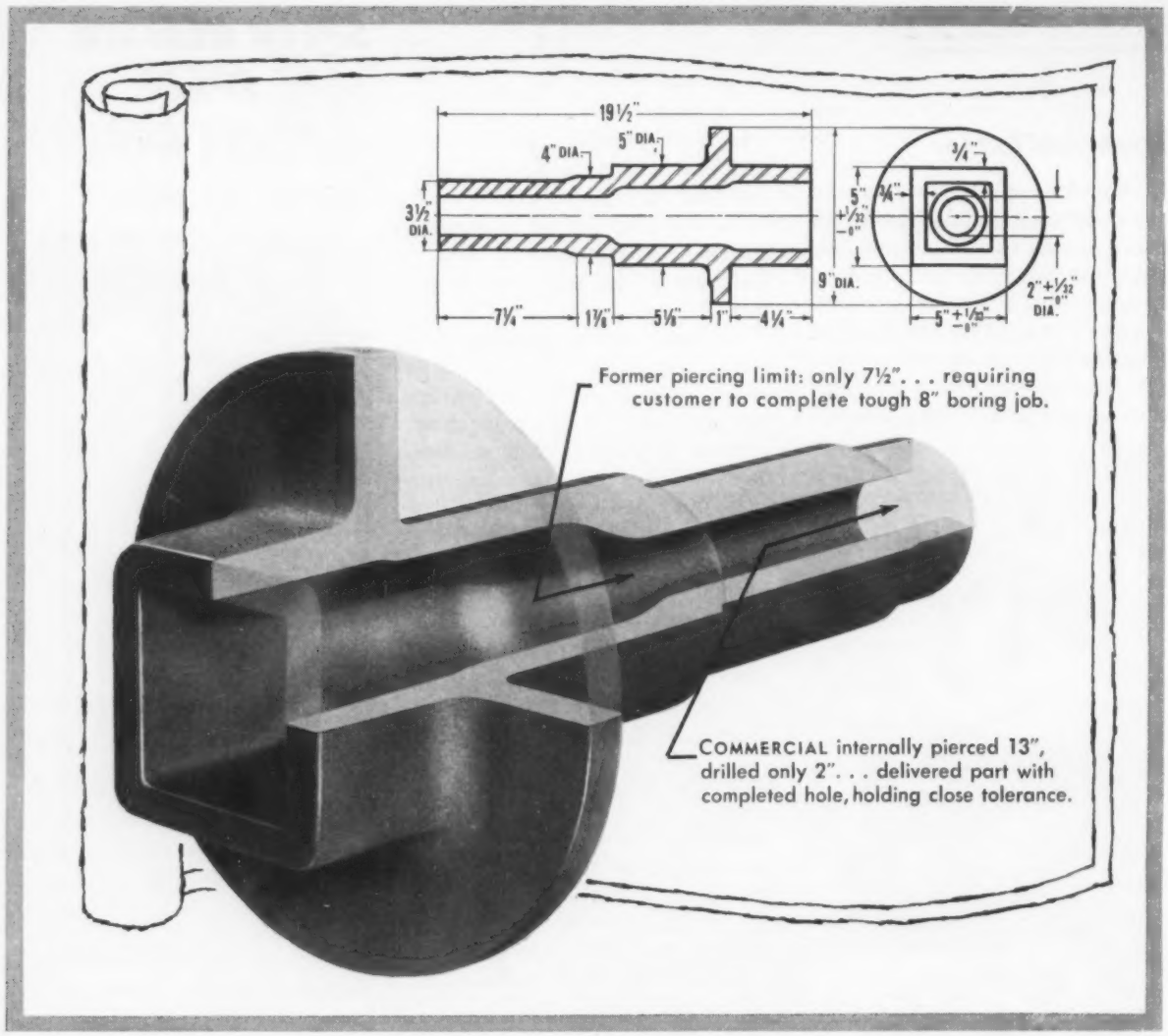
Now, heating of 25 tons of stainless steel slabs per hour is a continuous operation at Atlas Steels Ltd. The R-S Hi-Head Furnace reaches a high heat fast and maintains it uniformly in all parts of the furnace for the complete cycle. Heating time is reduced . . . there is no overheating of slab edges . . . and uniformity is assured on every piece. Labor is one-fourth that required on conventional furnaces. Floor space used is 75% less.

You can boost your "Quality Quota" if you heat with R-S Furnaces. For full technical details on faster slab heating write for the folder "Continuous Slab Heating."

R-S FURNACE CO., INC.
North Wales, Pa.

Car Hearth Furnaces
Continuous Furnaces
Rotary Hearth Furnaces

R-S FURNACES



"Task-Forging" Pierces Holes 60% Deeper

Advanced upsetting techniques at COMMERCIAL now permit internal piercing of forgings well beyond the commonly-accepted 7 to 1 length-to-diameter limit.

Good example of new advantages: a 39 lb. rear axle spindle. Formerly the customer had to drill 8" of the 1½" I. D. after forging—a tough job with a close concentricity tolerance.

Now "Task-Forged", the part leaves COMMERCIAL's versatile, integrated plant with completed bore . . .with a substantial savings in metal and machining.

For COMMERCIAL's "Task-Forge" engineering-upsetting-boring team, the improvement was a "1-2-3" routine:

(1) The square end, flange and round end were upset from a 2¾" bar of SAE 8640 steel.

(2) The internal hole of varying I. D. was punched 13". . . over 60% deeper than before!

(3) The remaining 2" of the 1½" I. D. was precision drilled in the same plant.

Like to see what the "Task-Forging" concept can do for you? Just send a sketch or drawing of your part to Dept. K-49.

COMMERCIAL SHEARING & STAMPING COMPANY

YOUNGSTOWN 1, OHIO

COMMERCIAL shearing & stamping

Mailing List

Sir:—We read with interest your weekly editorials and they are very much to the point; our country needs to be wakened up to the dangers facing it from many sides.

We are of the same opinion as you expressed in the issue of Nov. 5, and trust that we may be able to obtain 25 or 50 reprints of this editorial. We will make good use of them by sending them to our senators and congressmen who are not working for the best interest of the United States citizens and taxpayers.—Carl C. Guerrein, president, Cessna-Erie Corp., Erie, Pa.

In the Nov. 5 editorial Mr. Campbell discussed the possibility of the United States becoming a second rate power.—Ed.

About Mr. Fuller

Sir—We read with interest your article on Mr. R. Buckminster Fuller ("Bold, New Ways to Build With Metals") in the Nov. 12, IRON AGE, which, incidentally, was a good, comprehensive summary. But I would like to call to your attention the photograph and cutline error which appeared on P. 118.

The photograph, one of ours, is of the Oklahoma City Citizens State Bank, a Kaiser Aluminum stressed-skin dome. The architects on this building were Bailey, Bozalis, Dickinson and Roloff of Oklahoma City, and the structure in no way was "designed by Mr. Fuller."

Distinguishing Factors—The architects utilized the Kaiser Aluminum stressed-skin dome, on which the company holds various patent rights. Not detracting a bit from Mr. Fuller's contribution to the field of geodesics, he had nothing whatever to do with the Oklahoma dome, other than having developed the geodesic concept (of course important in itself) which was translated by Kaiser Aluminum into a structure which combines components of shell construction, shape truss design and stressed skin panels. This combination is what distinguishes the Kaiser Aluminum dome from other types of geodesic structures. — John Cashel, Public Relations, Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Kaiser's own brochure on the Kaiser Aluminum Dome states, "The method of determining the quantity of diamonds and the different sizes needed is based on R. Buckminster Fuller's system of 3-way grid division of the spherical icosahedron. Kaiser Aluminum holds exclusive license from Mr. Fuller under patents granted to him covering a geodesic dome and certain of its constituent parts."—Ed.

Sir—I read with interest your article on structures designed by R. Buckminster Fuller.

Included in it is the statement, "Mr. Fuller reports a license, with no advance royalties called for, is easily obtained on application to him."

Can you furnish us with his address where we can write him and secure information in regard to such licenses?——Bill Setzer, Executive Vice-President, Holston Steel Structures, Inc., Bristol, Tenn.

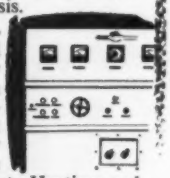
Mr. Fuller is constantly on the go, so mail inquiries about licenses and other matters to him in care of his assistant, John Dixon, 179 Columbia Heights, Brooklyn 1, N. Y. —Ed.

MARIAN A. STACHOWIAK,
Hayes Induction Heating Engineer, reports . . .

SELECTIVE HEAT TREATING CAN BE SIMPLE . . .

when equipment and application know-how go to work

High-Frequency Induction Heating . . . standard procedure for selective hardening, melting, annealing, brazing, preheating, hot forming, sintering, and vacuum heating . . . now takes a big step forward with another Hayes development — a new high-frequency induction unit that puts selective heating on a *simple* and *economical* basis.



PUSH-BUTTON Controls are featured with this new Hayes induction heater to obtain instant and exact heat distribution at any desired surface area of a steel part. Heating and quenching cycles are *automatically controlled* and are so rapid that distortion, decarburization, and excessive oxidation are practically eliminated. Protective atmosphere systems (pioneered by Hayes) can be supplied as an integral part of the induction unit.

UNIT Design Saves Space — because heater stations and power generator are incorporated in *one* compact cubicle . . . for more output per sq. ft. of floor space. Moreover, the Hayes unit includes work handling devices which can be set up simply, integrated into your production line, and operated as easily as any other machine tool.

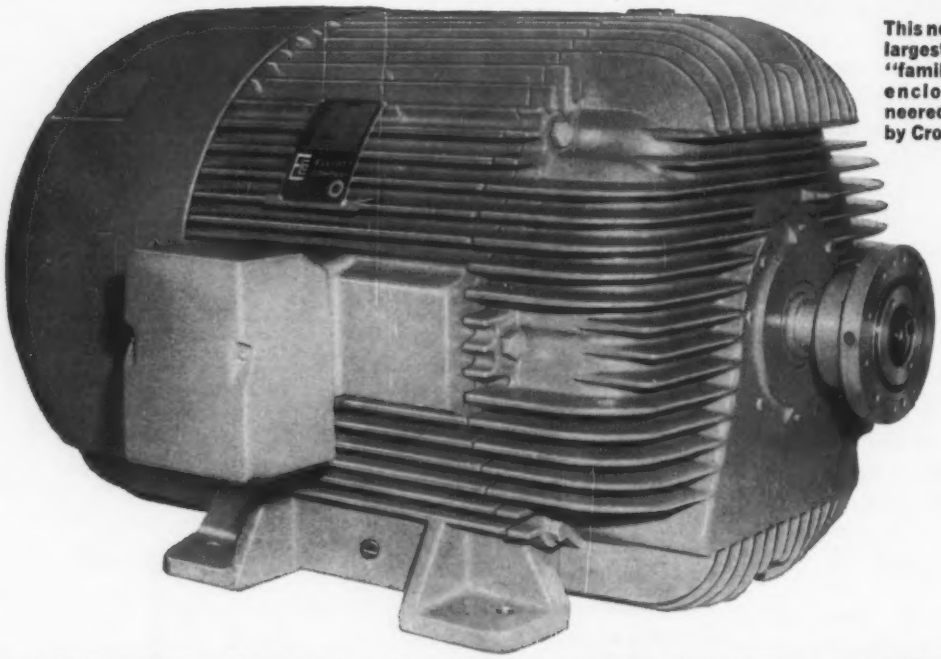
Safe, Easy Maintenance is another feature of Hayes' design. Easy-access panels provide plenty of working room for maintenance and adjustment of components. Safety interlock switches throughout shut off plate power when panels are opened. Write for information on Hayes new induction heating unit, work tables and accessories . . . or other "Results Guaranteed" furnaces in Hayes Certain Curtain line.

FREE BULLETIN 5910

C. I. HAYES, INC.
821 Wellington Ave. • Cranston 10, R. I.
Established 1905

It Pays To See Hayes for metallurgical guidance, lab. facilities, furnaces, atmos. generators, gas and liquid dryers.

BETTER COOLING MEANS LONGER LIFE LESS MAINTENANCE



This new 300-hp unit is the largest of the Elliott C-W "family" of ribbed-frame enclosed motors, pioneered in the United States by Crocker-Wheeler.

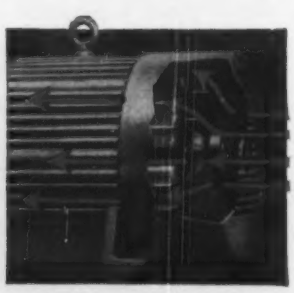
ELLIOTT C-W SEALEDPOWER MOTORS

The numerous thin, deep ribs of Elliott C-W SEALEDPOWER Motors are the most advanced development of the ribbed construction, pioneered in the United States by Crocker-Wheeler. Modifications of SEALEDPOWER totally-enclosed fan-cooled motors include explosion-proof designs in all ratings up to 300 hp. Either open greasable or pre-lubricated bearings can be furnished.

Highly-effective sealing prevents entrance of moisture, dust, dirt, corrosive materials; consequently these motors can be depended upon for long, trouble-free service.

In numerous cases, SEALEDPOWER motors are proving to be more economical than standard open motors because of their low maintenance and dependability.

Extra fins keep bearing cool. This potential trouble spot is effectively cooled by the generous extra fins seen in the photograph above.



Cooling blast hugs frame. Air is directed along fins extending entire motor length. Easy to clean — no enclosed cooling passages to clog up.

Newest data on modern enclosed motors—including explosion-proof—is given in Elliott Bulletin PB 6000-2. Send for free copy today.

ELLIOTT Company

CROCKER-WHEELER PLANT JEANNETTE, PA.

WB-2

COMING EXHIBITS

Plant Maintenance & Engineering Show — Jan. 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Tool Show—April 21-28, Detroit Artillery Armory, Detroit. (American Society of Tool Engineers, 10700 Puritan, Detroit 38.)

Welding Show—April 25-29,Great Western Exhibit Center, Los Angeles. (American Welding Society, Inc., 33 West 39th St., New York 18.)

Southwestern Metal Show — May 9-13, State Fair Park, Automobile Bldg., Dallas, Texas. (American Society for Metals, Metals Park, Novelty, O.)

Design Engineering Show — May 23-26, Coliseum, New York. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Production Engineering Show—Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Machine Tool Show—Sept. 6-16, International Amphitheatre, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

MEETINGS

DECEMBER

Electric Furnace Steel Committee —17th Annual conference, Dec. 2-4, Hotel Cleveland, Cleveland. Committee headquarters, 29 W. 39th St., New York.

Electronic Industries Assn.—Quarterly meeting, Dec. 2-4, Statler Hilton, Los Angeles, Calif. Association headquarters, 1721 DeSales St., N. W., Washington, D. C.

(Continued on P. 16)

NEW FROM KIDDE!

2½-gallon pressurized water

2½-gallon anti-freeze (loaded stream)

The easiest-to-operate portable fire extinguishers on the market today!

Here, for the first time, is a practical, sensible design for pressurized water and loaded stream extinguishers. No inverting, no bumping, no valves to turn, no pins to pull (safety lock automatically releases when nozzle removed).

These two new stainless steel Kidde portables feature simple, one-two operation—just aim at fire and push the button. Notice the way the hose is stored, safely out of the way. Notice the wide-open handle—to insure fast action even in gloved hands. Notice the dust-and-waterproof pressure gauges—which show at a glance whether the units are fully charged. All of the features—plus the slim design and light weight of these Kidde portables—make them the easiest-to-store, easiest-to-carry, easiest-to-operate portables on the market today.

Approved by Underwriters' Laboratories. Available in pressurized water for fires in ordinary combustibles, or anti-freeze loaded stream for fires in ordinary combustibles and flammable liquids. For more information, write to Kidde today.

Kidde

Walter Kidde & Company, Inc.
1249 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd., Montreal—Toronto—Vancouver

The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

MEETINGS

(Continued from P. 15)

National Assn. of Manufacturers—Annual meeting, Dec. 2-4, Waldorf-Astoria, New York. Association headquarters, 2 East 48th St., New York.

National Warm Air Heating & Air Conditioning Assn.—Meeting, Dec. 2-4, Chase Park Plaza Hotels, St. Louis, Mo. Association headquarters, 640 Engineers Bldg., Cleveland.

Material Handling Institute, Inc.—Annual meeting, Dec. 13-16, Savoy-Hilton Hotel, New York. Information: Hanson & Shea Inc., One Gateway Center, Pittsburgh 22, Pa.

JANUARY

Institute of Scrap Iron & Steel, Inc.—Annual convention, Jan. 10-13, Fontainebleau Hotel, Miami Beach, Fla. Institute headquarters, 1729 "H" St., N. W. Washington, D. C.

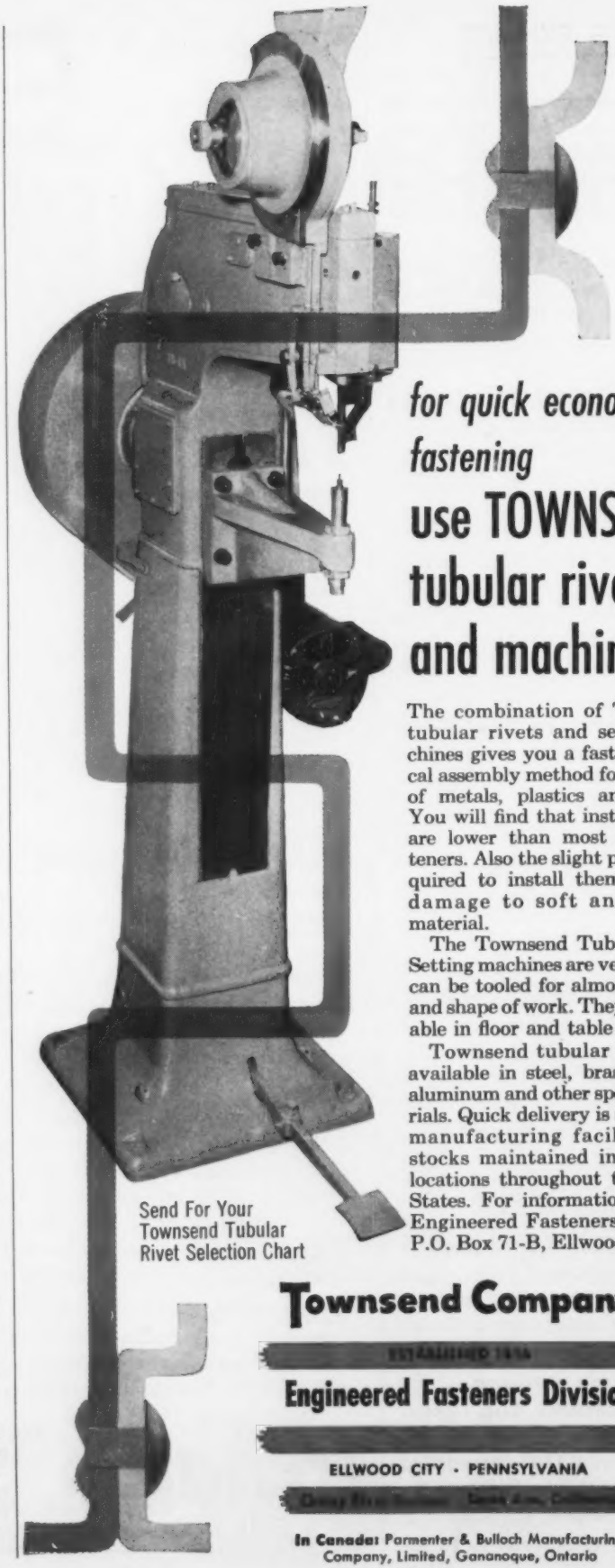
Society of Plastics Engineers, Inc.—Annual technical conference, Jan. 12-15, Conrad Hilton Hotel, Chicago. Society headquarters, 65 Prospect St., Stamford, Conn.

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 12-16, The Sheraton-Cadillac and Statler Hotels, Detroit. Society headquarters, 485 Lexington Ave., New York.

Steel Shipping Container Institute, Inc.—Winter meeting, Jan. 19-20, St. Regis Hotel, New York. Institute headquarters, 600 Fifth Ave., New York.

Assn. of Steel Distributors, Inc.—Convention, Jan. 30-Feb. 6, El Mirador Hotel, Palm Springs, Calif. Association headquarters, 29 Broadway, New York 6, N. Y.

American Institute of Electrical Engineers—Winter general meeting, Jan. 31-Feb. 5, Hotel Statler, New York, Institute headquarters, 33 W. 39th St., New York 18, N. Y.



for quick economical fastening

use TOWNSEND tubular rivets and machines

The combination of Townsend tubular rivets and setting machines gives you a fast, economical assembly method for a variety of metals, plastics and fabrics. You will find that installed costs are lower than most other fasteners. Also the slight pressure required to install them prevents damage to soft and fragile material.

The Townsend Tubular Rivet Setting machines are versatile and can be tooled for almost any size and shape of work. They are available in floor and table models.

Townsend tubular rivets are available in steel, brass, copper, aluminum and other special materials. Quick delivery is assured by manufacturing facilities and stocks maintained in strategic locations throughout the United States. For information write to Engineered Fasteners Division, P.O. Box 71-B, Ellwood City, Pa.

Send For Your Townsend Tubular Rivet Selection Chart

Townsend Company

ESTABLISHED 1916

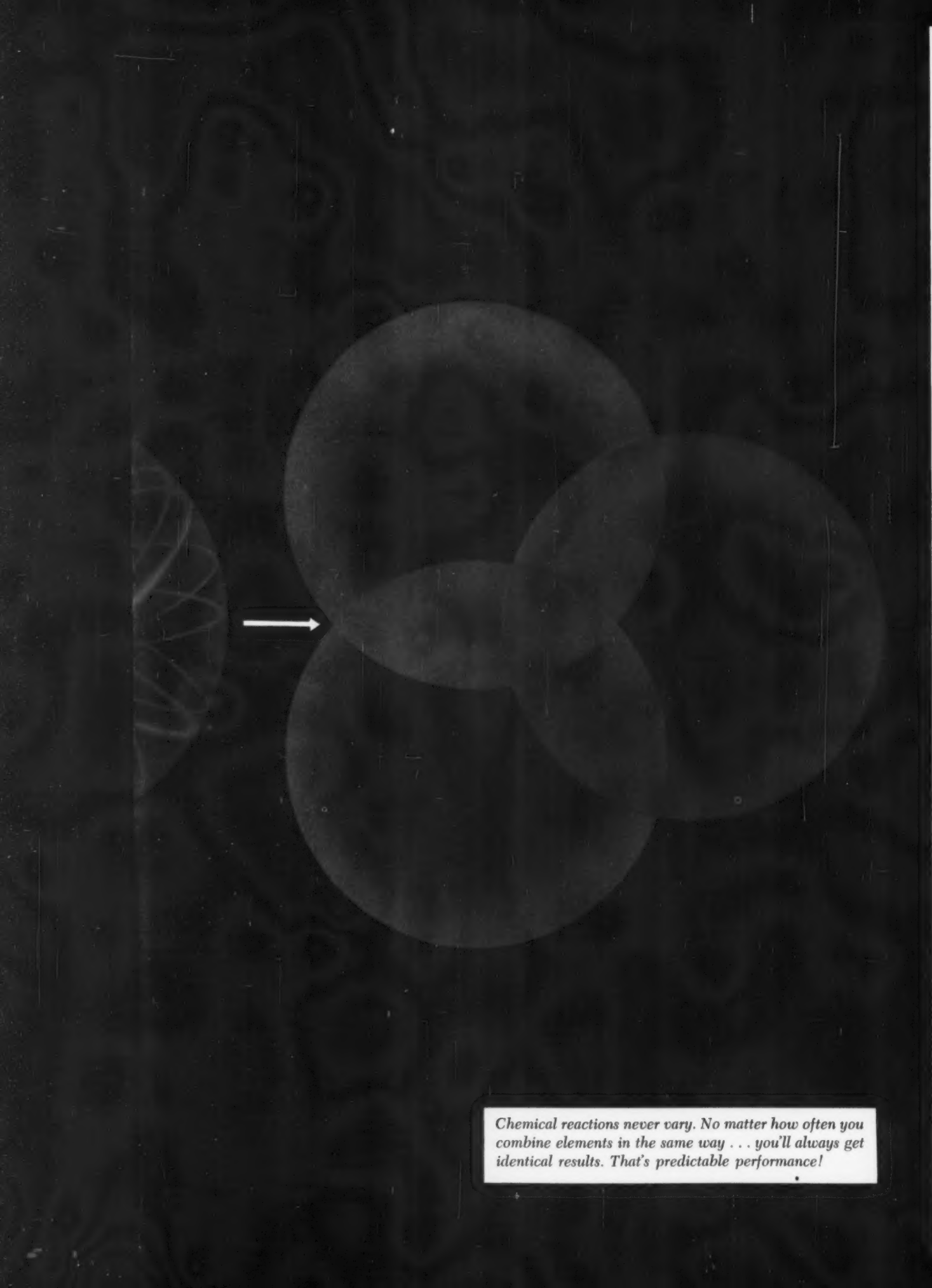
Engineered Fasteners Division

ELLWOOD CITY · PENNSYLVANIA

Chicago Plant · Santa Ana, California

In Canada: Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario

959



Chemical reactions never vary. No matter how often you combine elements in the same way . . . you'll always get identical results. That's predictable performance!

Predictable as a chemical reaction . . .

this new steelmaking process

Carpenter MEL-TROL®

gives you the most consistent performance you've ever had from stainless!

A step beyond quality control! *Carpenter's* exclusive MEL-TROL process includes a *patented* mold which reduces segregation of harmful impurities during solidification of the ingot. This ingot is more uniform . . . freer from segregation. You get clean, sound, tough metal from surface to core area . . . in every bar . . . in every lot.

Predictable performance! Only *Carpenter* stainless steels give you such positive assurance of fast, safe fabrication . . . free and easy machinability you can really count on. And not only will *Carpenter* stainless steels save you time and money in the shop . . . they will also enhance your product reputation in the field. For no matter what combination of properties your product demands in service, you can count on getting them again and again . . . with perfect uniformity. You get predictable performance all the way.

Immediate delivery! Most grades of these MEL-TROL Stainless Steels are ready for off-the-shelf delivery from your nearby *Carpenter* SERVICE-CENTER. And when the need arises, don't overlook other *Carpenter* steels of predictable performance: High Temperature Alloys—Tool and Die Steels—Electronic, Magnetic and Electrical Alloys—Special-Purpose Alloy Steels—Tubing and Pipe—Fine Wire Specialties.

New concepts in service! With the addition of new melting and finishing facilities, our capacity is nearly doubled. Better-than-ever quality . . . more research . . . more technical assistance . . . more local warehouses . . . *Carpenter* is growing bigger and better in all directions. Building upon a long history of pride in craftsmanship . . . backing up our faith in the future with dollars on the line . . . we are combining the best of modern technology and traditionalism. No wonder more and more men in industry, especially customers who know us best, refer to *Carpenter* as . . . *a new company 70 years old.*

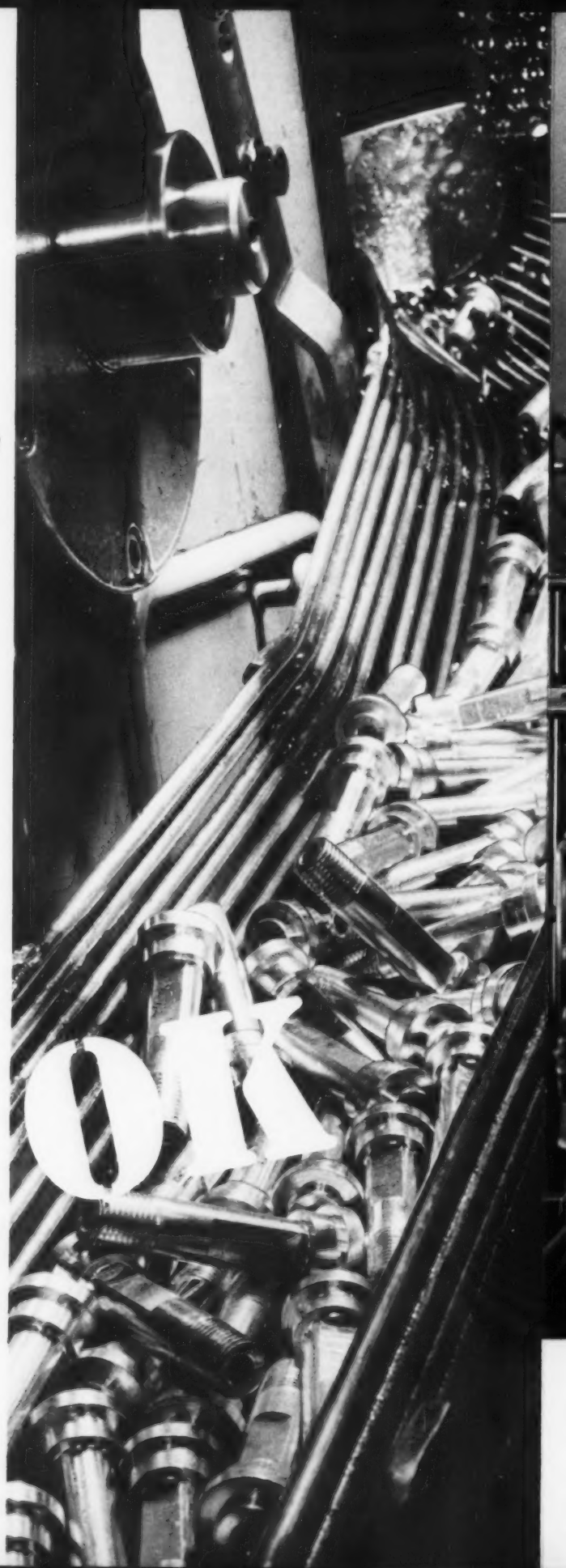
Carpenter **steel**

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

. . . don't you wish
you had that much faith
in the uniformity of the

stainless steel bar stock

you use?



$2H_2 + O_2 \rightarrow 2H_2O$

You can always count on this chemical reaction. It's absolutely predictable . . .

local service from coast to coast!

stainless steels! tool and die steels! special-purpose alloy steels!

Check your nearby Carpenter SERVICE-CENTER *first:*

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Atlanta, Ga.	Cleveland, Ohio	Houston, Texas	Providence, R. I.
Bridgeport, Conn.	Dayton, Ohio	Indianapolis, Ind.	St. Louis, Mo.
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Chicago, Ill.	Fort Washington, Pa.	Milwaukee, Wis.	Toledo, Ohio
Cincinnati, Ohio	Hartford, Conn.	Mountainside, N. J.	Woodside, L. I., N. Y.

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Evansville, Ind.	Los Angeles, Calif.	Pittsburgh, Pa.	Syracuse, N. Y.
Grand Rapids, Mich.	Louisville, Ky.	Port Arthur, Texas	Worcester, Mass.
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The Carpenter Steel Company, Reading, Pa.

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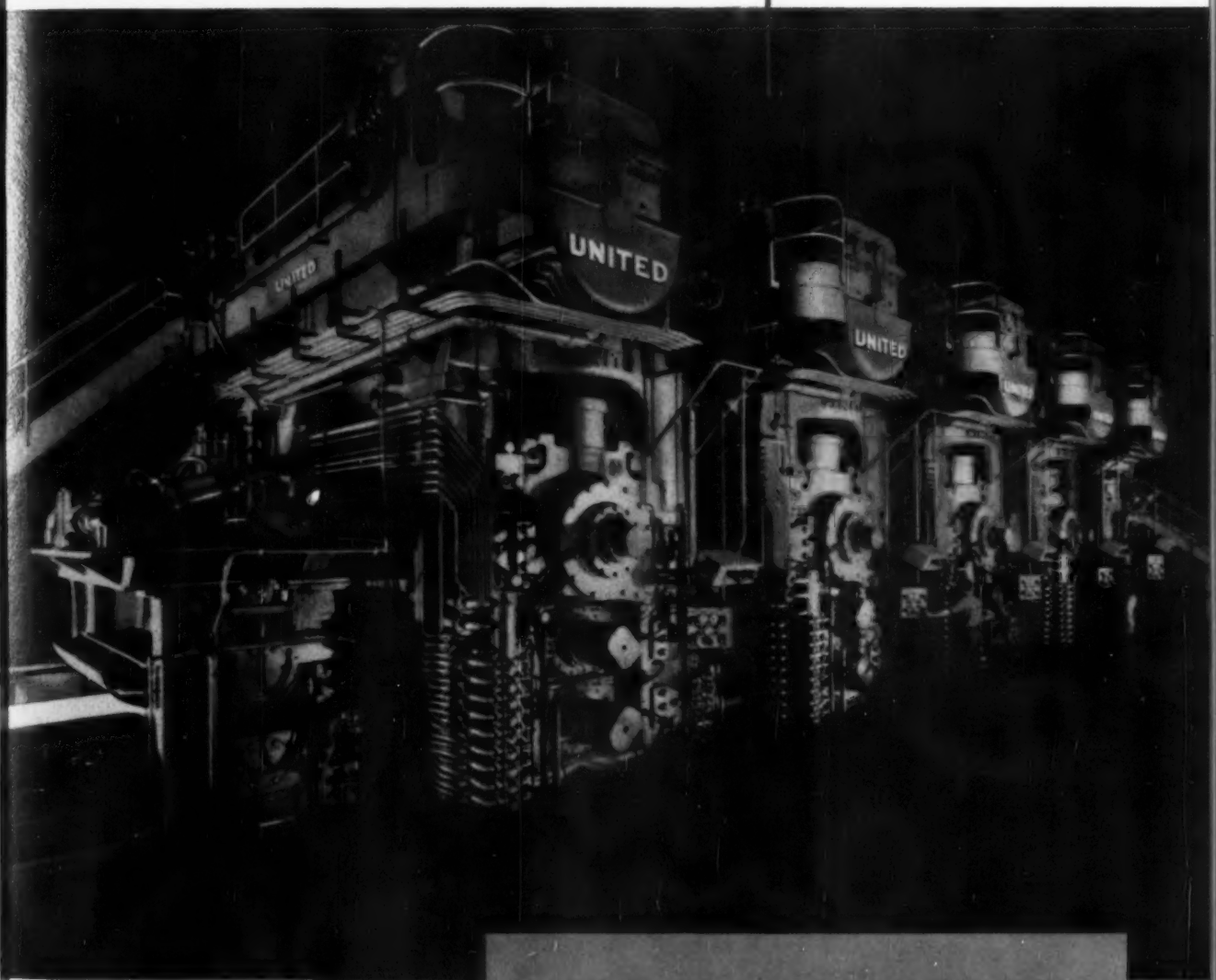
UNITED®

100" 5 Stand Continuous Hot Aluminum Finishing Train



UNITED ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

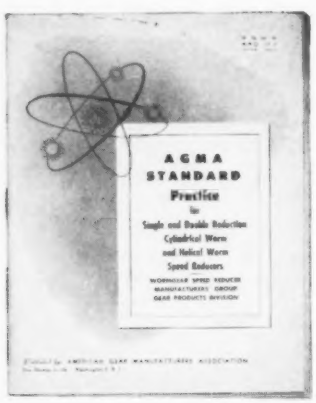
Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery, Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

DE LAVAL offers new A.G.M.A. Gear Standards Booklet for Engineers

You will not want to be without this newly published American Gear Manufacturers Association booklet. It outlines the new standards for single and double reduction cylindrical worm and helical worm speed reducers.



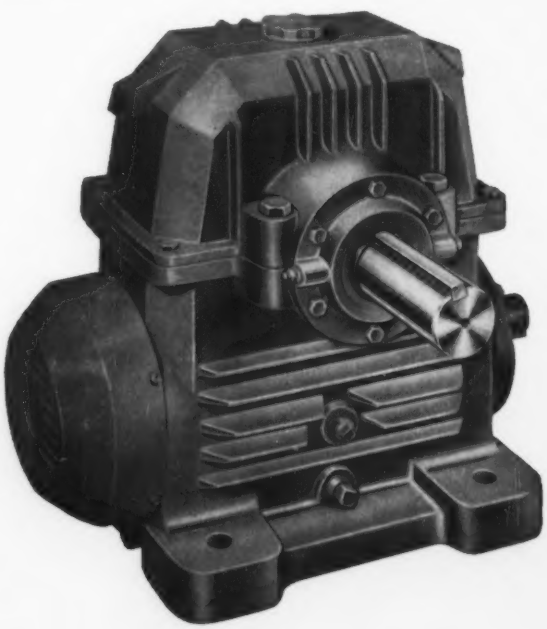
Get this new A.G.M.A. 440.03 booklet free of charge by request on your company letterhead.

This new standards booklet contains important design data including: Power rating of worm gears • Ratio correction factor (Km) • Materials factors (Ks) • Velocity factor (Kv) • Coefficient of friction(μ) • Thermal factor • Service factors • Efficiency • Overhung load capacity • Lubrication.

The materials factor (Ks) and the coefficient of friction (μ) are new, reflecting the latest advances made in worm gearing in the past few years.

We have also recently published our new Delroyd Worm Gear Sets Catalog 3800 and Delroyd Single Reduction Worm Gear Catalog 3805, which contain comprehensive information on the selection of these units.

De Laval furnishes worm gearing under the trade name DELROYD and has a complete line from 1⅛" to 36" center distance, in horsepower ranges from .04 to 700 and in ratios from 5: to 4900:.



DE LAVAL *Steam Turbine Company*

899 NOTTINGHAM WAY, TRENTON 2, NEW JERSEY

DL-488

Experience...
Gained through countless fastener problems solved over the past 52 years means a greater ability to solve each new problem more quickly ... more economically. We're proud of this accumulated "know-how" because it assures our customers of highest quality standard and special fasteners.
FERRY CAP
& SET SCREW COMPANY
2151 Scranton Road • Cleveland 13, Ohio
Cold upset screw products
...standards and specials.

You get steel + plus from U.S. Steel

"Our steel spring recommendation helped sell 20,000 modern rocking chairs"

SAYS FRAN SMILEY, USS SPRING ENGINEER, AMERICAN STEEL & WIRE DIVISION, WAUKEGAN

"The Homecrest Company of Wadena, Minnesota, saw a place in the furniture market for a modern rocking chair. They wanted to make the venture but only if perfectly reliable and simple springs could be developed for their design.

"While the chair was still in the design stage, Homecrest contacted our Spring Engineering Consulting Service. Our engineers went to work with the Homecrest designers. As a result of many tests made by our Spring Fatigue Testing Laboratory, we recommended a pair of round wire helical single coil torsion springs.

CRACK!
RELAX!
THAT'LL HOLD THREE LIKE UNCLE ELBERT
THEY DON'T MAKE HORSES LIKE THEY USED TO
IT'S NOT THE HORSES... IT'S THOSE STEEL SPRINGS

"When Homecrest put the new rocking chairs on the market, the design soon got a reputation for strength and durability. Sales have totaled over 20,000 chairs . . . And there hasn't been one single report of a spring failure."

"Engineering assistance is only one of the U.S. Steel plus services."

When you buy from U.S. Steel you get steel plus . . . technical assistance . . . research . . . facilities . . . marketing assistance.

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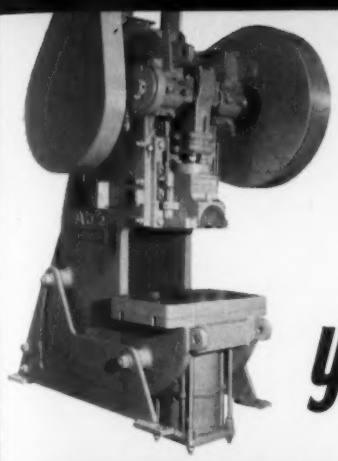
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel



for grass roots economy you just can't match this OBI

Cold, hard statistics leave no doubt. Wherever performance data and cost records are compared, the Series A Inclinable is way out front in parts produced per dollar expended.

On the most demanding jobs . . . where the clutch is engaged and disengaged at every press stroke . . . where three-shift operation continues day after day . . . *no OBI can even approach it in thrifty operation, fool-proof simplicity, and safety.* Readily understandable are the reasons why:

Niagara's famed, multi-point mechanical sleeve clutch picks up the load on 14 engaging jaws, applying the driving force concentrically without keys or pins. Instant engagement and maximum productive strokes per minute are assured.

There are no complicated electrical circuits, relays, limit switches or solenoids . . . no palm buttons, air valves or rotary air connections. In fact no air is consumed.

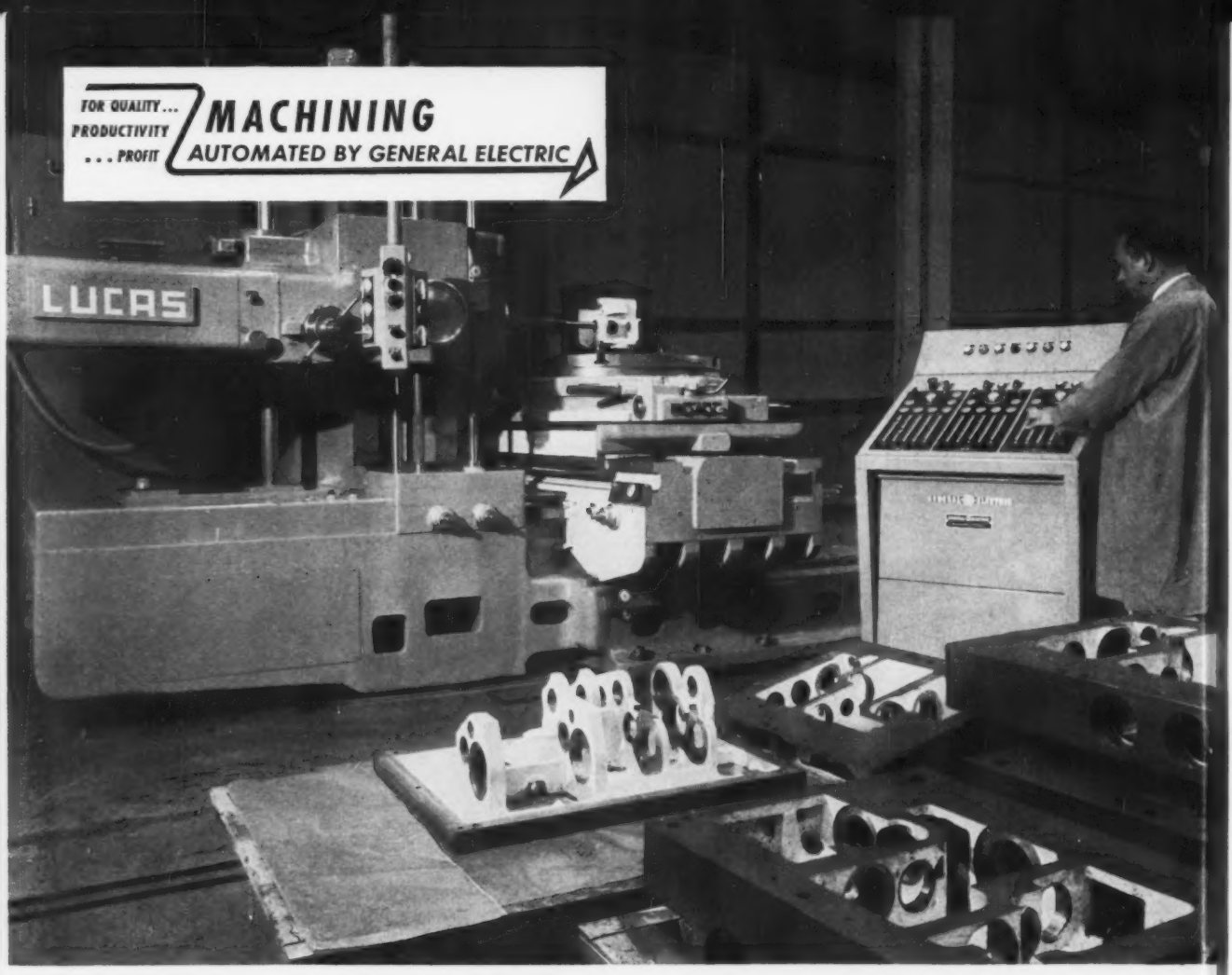
With fewer parts and simpler construction, there's less to go wrong, less to repair or replace. As a result, this is not only a more economical press to operate, but a much safer press as well. Records of thousands of presses are factual proof that the Niagara mechanical sleeve clutch is unequaled in safety and reliability.

Built in 13 standard sizes, with shaft diameters from 1¼" to 6½" and capacities from 5½ to 190 tons, Niagara Series A Presses can be readily equipped with numerous accessories for individual requirements.

GET THE FACTS AND FIGURES. WRITE FOR NEW BULLETIN 58N

NIAGARA

NIAGARA MACHINE AND TOOL WORKS • BUFFALO 11, N. Y. District Offices and Distributors Everywhere



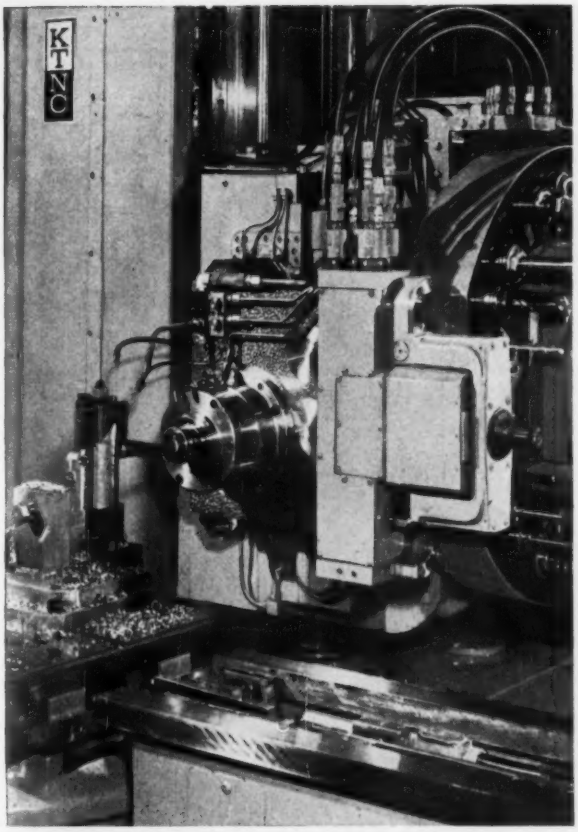
INCREASE MACHINE UTILIZATION

MARK SERIES NUMERICAL CONTROLS.....standard, job-proved packages now in use on a wide variety of machines

General Electric's Mark series of standard, pre-engineered numerical control packages—with systems for controlling 1 to 5 motions plus machine auxiliary functions — are compiling impressive performance records on scores of machines throughout American industry today.

Machine operation is completely automatic—from punched tape prepared on a standard automatic typewriter. If desired, semi-automatic positioning, useful for prototype work, is obtained with manually set dials on the control station.

Key components of a typical Mark package are a controller, a punched tape reader, operator's control station, servo drives and position-sensing units.



ONLY ONE SETUP NEEDED to produce even highly complex parts on this G-E controlled multi-purpose milling, boring and drilling machine means dramatic savings. And, tooling savings on one group of 6 parts totaled $10,000.

83% LEAD-TIME REDUCTION is average for parts produced on this 6-spindle turret drill directed by G-E numerical control. Tooling costs are 40% of former methods. Tape data-storage saves expensive tooling space.

with General Electric numerical control

Move quickly from part to part, cut non-productive machine time

An idle machine . . . and an investment going to waste! This is the case in plants throughout metalworking today—perhaps including yours!

Many reasons are apparent: tool-room lag in making fixtures; long setups during changeover; excessive manual positioning; or, poor machine scheduling due to manual operation. Whatever the case, this adds up to something you cannot afford: high unit costs.

But, there is a solution! General Electric numerical control on today's modern machines provides increased machine utilization that signals the end of long lead times . . . multiple setups . . . long machining cycles . . . and, excessive in-process inventories.

Reports prove the advantages of G-E numerical controls. One user states that with G-E controls, his milling, boring and drilling machine is making chips 55% more of the time . . . setup time is cut 40% . . . and positioning time is 50% less. All this—plus a major reduction in parts inventories made possible by G-E tape control's ability to exactly reproduce a part at any future time—enabled this user to pay for his numerically controlled machine in less than two years.

In another case, a new multi-purpose milling machine—directed by G-E numerical control—selects 31 different tools automatically. Non-productive machine-cycle time is virtually eliminated, and complete part machining is possible on a *single* setup. On one small-lot part, 749 hours were saved. Tooling savings on a group of 6 different parts totaled over $10,000.

Join with these and hundreds of users who are increasing machine utilization and worker productivity, and eliminating special tooling cost with G-E numerical control. See your G-E Apparatus Sales Engineer or machinery builder today. General Electric Co., Specialty Control Dept., Waynesboro, Va. 795-8

Progress Is Our Most Important Product

GENERAL ELECTRIC

Mobilplex ep

The Multi-Service Grease with unique Calcium EP Complex. Never before in a single lubricant such a wide range of use . . . such a margin of superiority . . . such a potential for maintenance savings.

Above: Mobilplex EP produces excellent results in Timken OK-Load tests, provides outstanding performance in heavy-duty equipment.

High-tonnage work-roll bearings in hot mill, cold mill and single stand service last longer with Mobilplex EP.

Outstanding load-carrying ability is one of the many important properties of Mobil's new Multi-Service Grease —*Mobilplex EP*. In your steel mill you'll find it ideal for work-roll and back-up-roll bearings, conveyor bearings, and run-out-table bearings. Even under the most severe conditions of heavy or shock loads, Mobilplex EP provides maximum protection against wear. Mobilplex EP also offers good pumpability at low temperatures, excellent resistance to heat, and extra protection against water and rust. It is a singularly tenacious and adhesive lubricant.

This Multi-Service grease has outstanding oxidation resistance as well as excellent storage and structural stability. These qualities, plus the great versatility of Mobilplex EP, make it useful throughout the steel mill.

Mill operators throughout the country are finding Mobilplex EP extremely effective in extending bearing life and protecting production schedules. In addition, they're saving more than with ordinary multi-purpose greases because Mobilplex EP makes it possible to reduce application frequency, simplify storage and handling procedures.

Contact your Mobil representative for full details. He can show you results of laboratory performance tests of Mobilplex EP and five competitive extreme-pressure greases. You'll see why Mobilplex EP is rated tops!

MOBIL OIL COMPANY, A Division of Socony Mobil Oil Company, Inc.

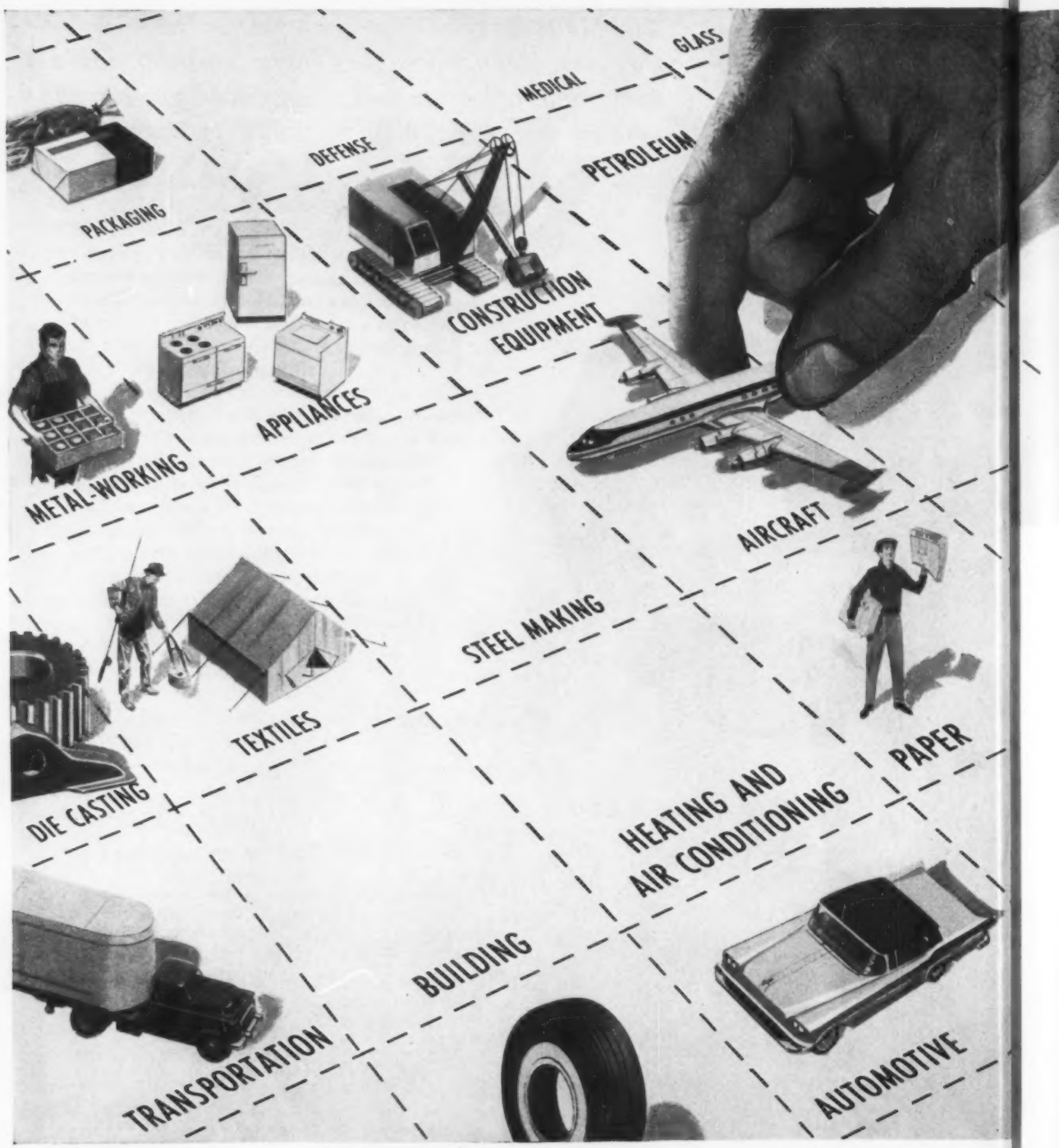
MULTI-SERVICE ABILITY OF MOBILPLEX EP

ANTI-FRICTION BEARINGS (*horizontal and vertical*). Temperatures in the range of 300 F. Heavy or shock loads. Water contamination. Speeds—low, normal, high.

PLAIN BEARINGS All normal mechanical and operating conditions. Temperatures in the range of 300 F. Waterwash. Heavy or shock loads.

DISPENSING AND APPLICATION DEVICES Transfer pumps. Hand and power guns (*long lines*). Central greasing systems.

Mobil

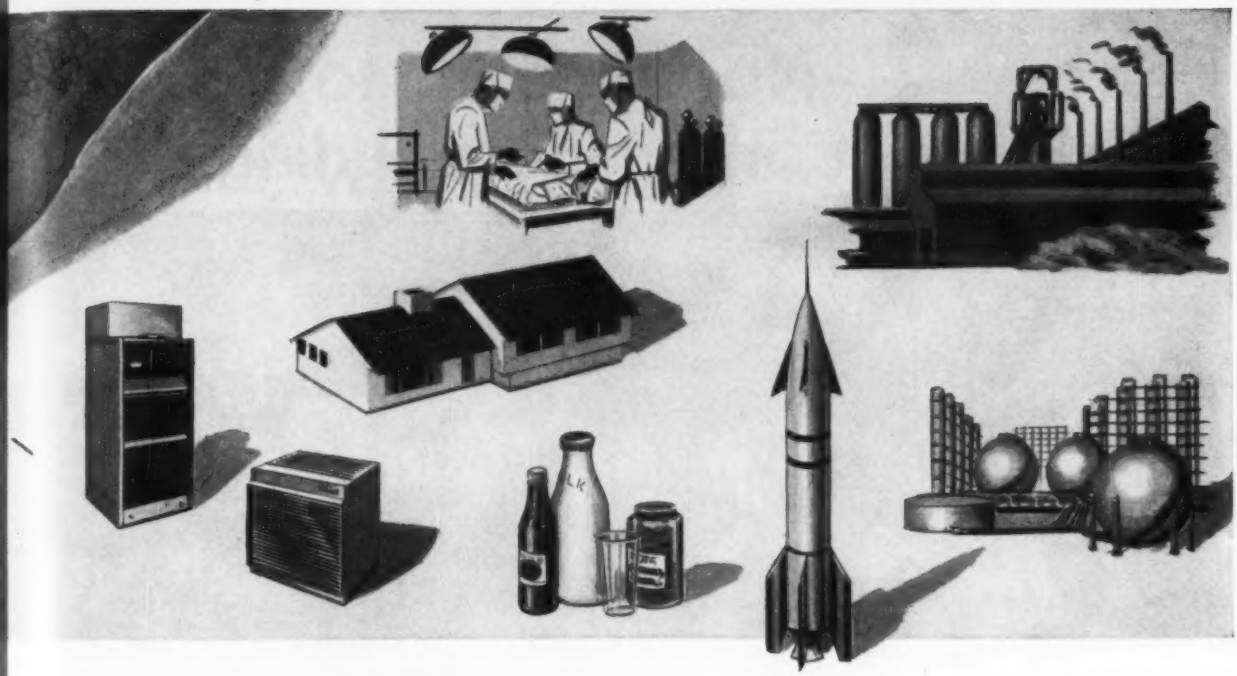


M-R MIDLAND-ROSS CORP.

MIDLAND—

Executive Offices: 55 Public Square • Cleveland 1, Ohio

DIVERSIFIED TO SERVE NEARLY ALL INDUSTRIES . . .



To serve even more industries even better...

MIDLAND-ROSS ADDS SURFACE COMBUSTION and JANITROL

On November 9, Midland-Ross Corporation acquired for cash the Surface Combustion Corporation, its Janitrol Divisions, and subsidiaries.

Midland-Ross's purchase of Surface is another step in its program of planned expansion into new products, services and markets. Surface and Janitrol fit this pattern ideally. No changes in management or operations are contemplated for the new acquisitions.

Already serving scores of industries, Midland-Ross will now add many other growth industries being served by Surface and Janitrol... steel-making, metalworking, ore processing, petroleum refining, glass, medical, and marine with Surface and Kathabar equipment... residential, commercial and industrial building with nationally advertised "Janitrol" oil- and gas-fired furnaces, unit heaters, and air-conditioning equipment... aircraft and missile with Janitrol Aircraft products.

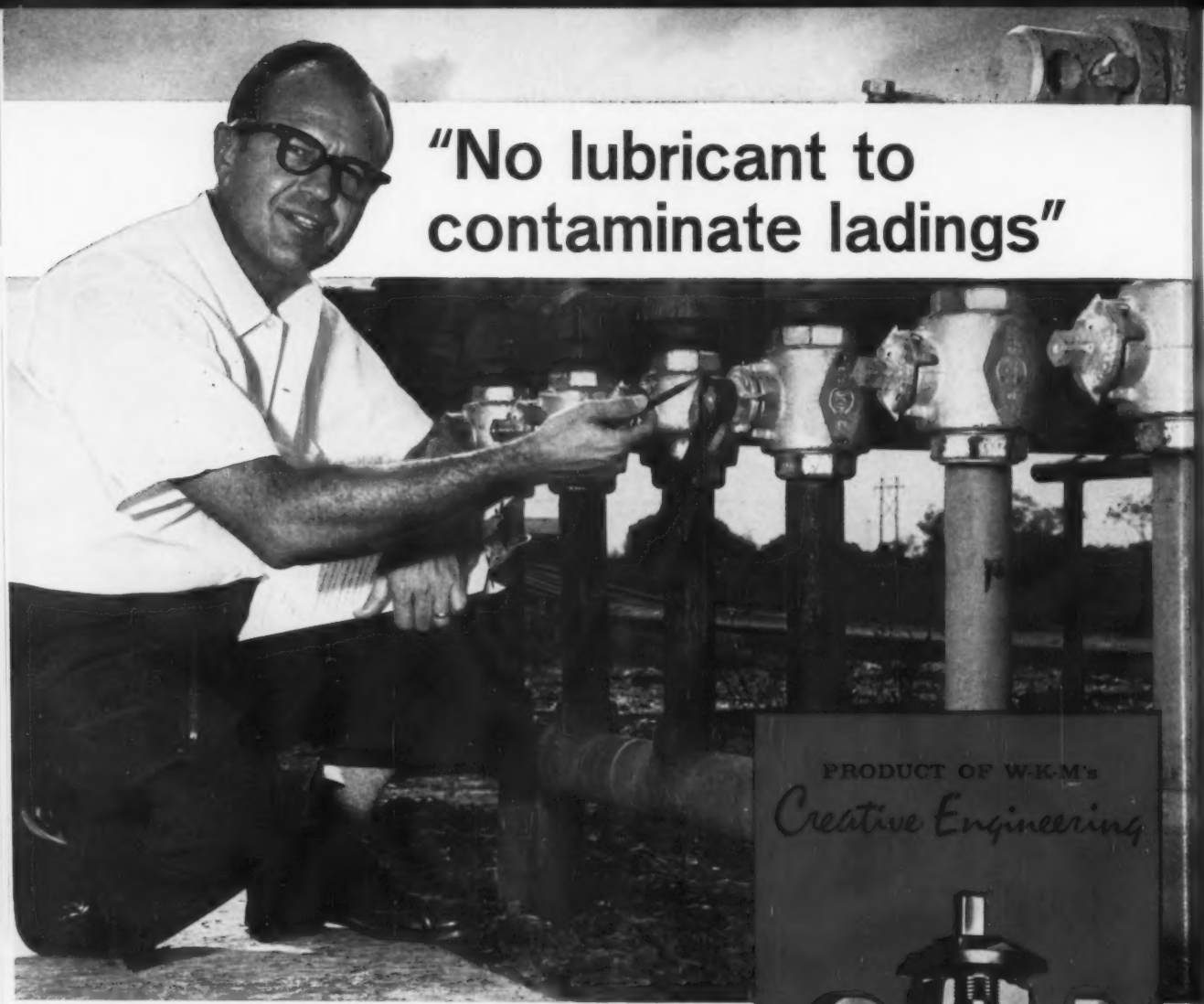
Assets of the enlarged Midland-Ross organization are now over $70,000,000. Employees now total 5,800. Fourteen plants are located in six states and Canada. Sales in 1960 are forecast at more than $120,000,000.

For a copy of "Quick Facts about Midland-Ross, Surface, and Janitrol," write to:

D—ROSS CORPORATION

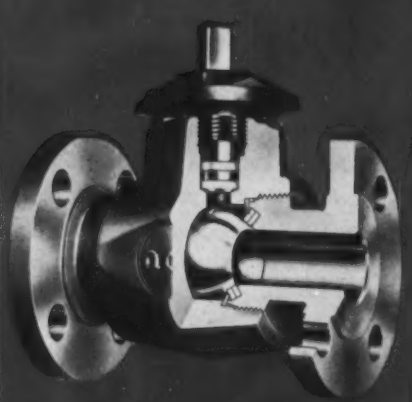
Automotive frames; process and production equipment for the paper, textile, rubber, plastics, and foil industries; pneumatic controls and compressors for mobile equipment; power brakes; die castings; metal-decorating, laminating and painting equipment; steel-mill equipment and heat treat furnaces; industrial ovens; humidity-control equipment; residential, commercial and industrial heating and air-conditioning equipment; aircraft, missile, and ground-support heaters, heat exchangers, and controls.

ES . . . INTEGRATED TO SERVE THEM BETTER



"No lubricant to contaminate ladings"

PRODUCT OF W-K-M's *Creative Engineering*



acf® non-lubricated Ball Valves

ACF Ball Valves are specially designed for ladings that require absolute purity. There is no lubricant, no possibility of contamination. The chrome-plated ball is suspended between Teflon seats under compression for leakproof sealing.

A quick quarter-turn operates this rugged valve. Specify it. You'll get efficient, economical performance. *Available at leading supply stores everywhere.*

Service-proved for 4½ years with such ladings as: high octane gasolines • alkalis • caustics • liquefied petroleum gases • butane • propane • synthetic fuels • penetrating gases • alcohol.

WRITE FOR CATALOG 1000

W-K-M

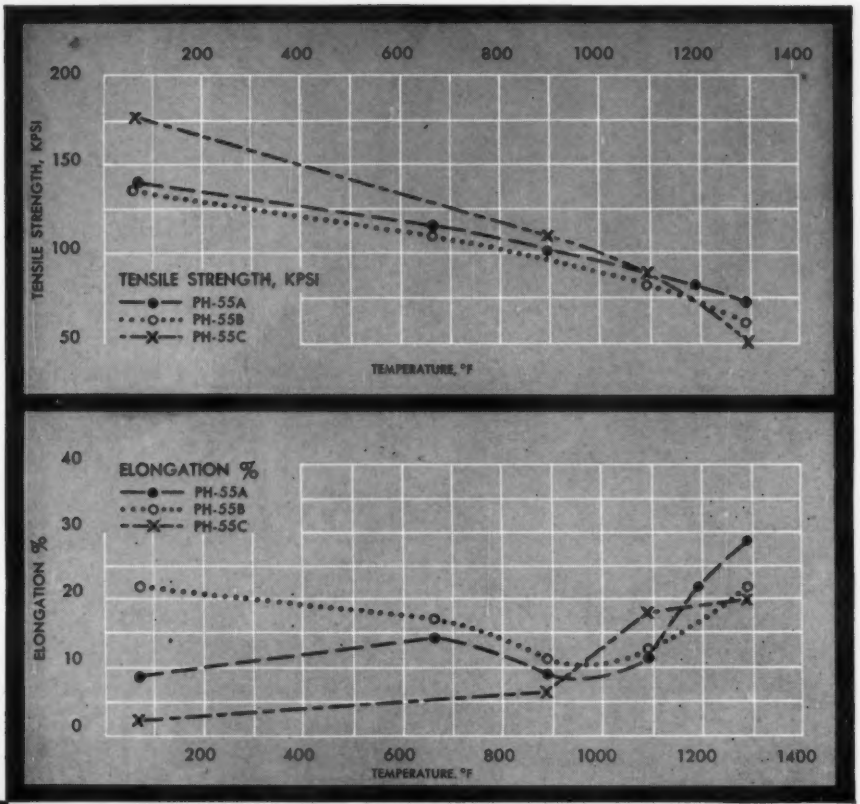
DIVISION OF acf INDUSTRIES
INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

ACF non-lubricated Ball Valves feature full bore conduits, Teflon stem gaskets and seats that are sealed from the lading flow.

Working Pressures: In carbon steel with ASA ratings of 150 and 300, and a few sizes in ASA 600; in semi-steel with 200 and 400 pound ratings.

Sizes: ½" through 6".

5911-R



Balanced physical properties—Alloy "A" has good hardness and strength, even at elevated temperatures, plus a moderate amount of ductility and toughness. "B," though less hard, exhibits improved ductility and toughness at practically the same strength level. "C" provides optimum combination of hardness and strength at room temperatures.

Precipitation-hardenable stainless steel alloys by Cooper Alloy that combine corrosion resistance, high hardness, machinability and strength even at high temperatures.

New stainless steel alloys by Cooper Alloy

Where Can You Use Them? Cooper Alloy Corp., whose name for the past 36 years has been associated with outstanding developments in casting of stainless steel, now brings American industry another unusual "first": a series of 18-8 stainless alloys which combine corrosion resistance, high hardness, high strength and machinability. The new alloys maintain these properties even at temperatures up to 1400°F., resisting pitting corrosion and the detrimental erosion effects of velocity and suspended abrasives which accentuate corrosion damage.

The alloys in this new series are:

PH-55A: A high-strength, high-hardness alloy designed for corrosion-erosion and corrosion-abrasion conditions. Outstanding pitting resistance.

PH-55B: A high-strength alloy of greater ductility and lower hardness than "A," for corrosion resistance of parts subjected to a combination of stress and shock.

PH-55C: With greater corrosion resistance, hardness, and strength than "A," but less ductility and shock resistance.

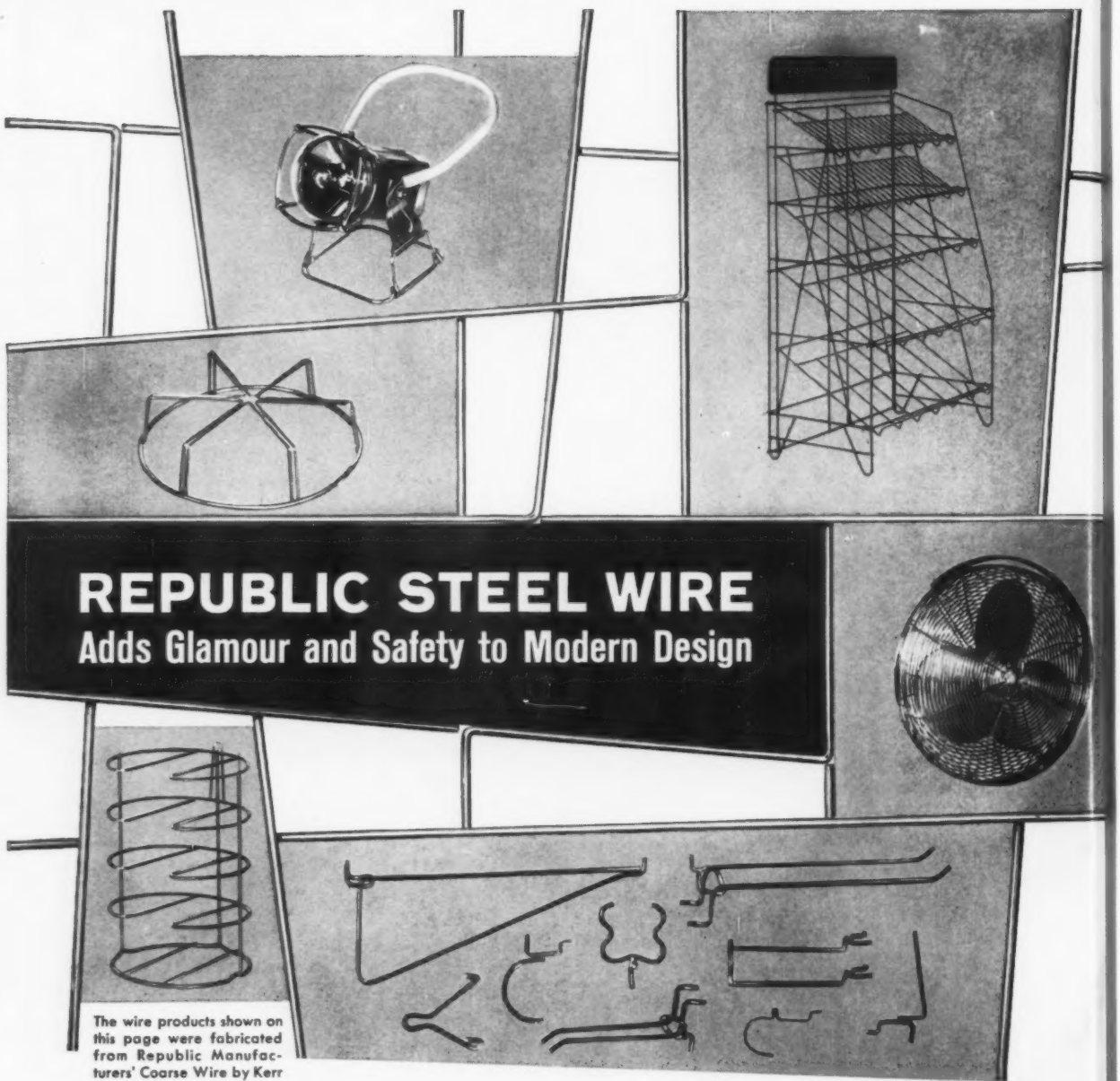
All PH-55 Alloys have higher strengths in the 1200-1400°F. range than do most other corrosion-resistant precipitation-hardening alloys, and they maintain their hardness even after prolonged exposure to these high temperatures. Alloy "A" is highly resistant to pitting corrosion; both "A" and "C" to high-velocity erosion-corrosion such as is common in pumps handling corrosive abrasives. All three are in general superior to 316 alloys in all corrosive applications except hot conc. HNO_3. Patents have been applied for or granted on the PH series of alloys.

Alloys "A," "B," and "C" are all easily machined when in the annealed condition. Welding is routine, and heat treatment easy and relatively uncritical.

Where can YOU use these alloys? They should be very useful anywhere that velocity, abrasion, wear, and high temperature are present under highly corrosive conditions.

For further information, write to Cooper Alloy Corp., Hillside, N.J.

COOPER ALLOY



The wire products shown on this page were fabricated from Republic Manufacturers' Coarse Wire by Kerr Wire Products Company, Chicago, Illinois.

Manufacturers who produce a wide variety of wire forms, such as The Kerr Wire Products Company, find Republic's wire a valuable aid in meeting design requirements, minimizing losses, and stepping up production.

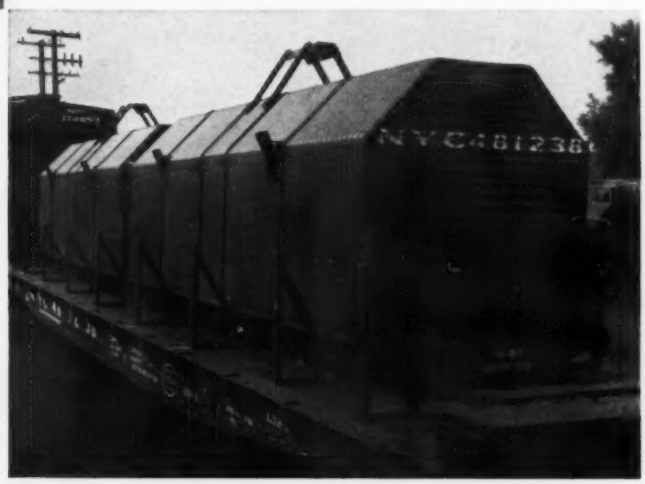
Uniform quality assures accurate, easy forming with adequate strength and rigidity, and is one of the reasons why Republic Steel Wire is specified for difficult design and forming problems. Up-to-date machines and methods, skilled laboratory control and careful inspection assure every purchaser of Republic Steel Wire that it will suit his specific requirements.

Republic produces wire in a wide range of sizes, grades, and finishes. Large tonnages are used to fabricate fan guards, wire partitions, racks, grilles, display stands, reinforcing specialties, threaded fasteners, and many other wire products.

Republic Wire Metallurgists are always available to work with your personnel in solving production problems. This service is obligation-free. Mail the coupon if you would like an experienced wire metallurgist to call.

REPUBLIC PIG IRONS HELP PRODUCE highest quality die sets for the metal stamping industry. The Producto Machine Company, Bridgeport, Connecticut, casts die set parts in their own foundry using only raw materials with a definite known analysis, including Republic Pig Irons. The pig iron portion of the charge consists of equal parts of Chateaugay Pig Iron and Republic Malleable Pig Iron. The year-in, year-out uniform chemistry of these fine irons helps Producto produce high quality, laboratory-controlled castings. The company has found that there is no better, no more economical means for insuring strong, flaw-free, easy-to-machine castings. A Republic Pig Iron Metallurgist will give you all the facts on all Republic Pig Irons for quality castings. Mail the coupon today.

REPUBLIC STEEL SHEETS HELP PRODUCTION PROBLEMS VANISH. Whatever your product or production requirement, Republic can supply the right steel sheet to solve your problem. As a major producer of flat rolled sheets, Republic has developed and can furnish top-quality steel with the proper characteristics to provide easy fabrication and product dependability. Available in ENDURO® Stainless Steel, Electro Paintlok®, Continuous Galvanized, and Galvannealed. The coupon will bring you complete facts.



REPUBLIC COIL COVERS HELP PROVIDE shipping protection for coil users. These covers offer excellent weather protection, shut out dirt, stop vandalism, eliminate costly replacement of short-lived tarpaulins, eliminate the need for paper wrappings. Covers are easily handled by overhead or trackside crane and are designed for stacking. Republic Coil Covers measure 22 feet long, six feet wide, and six feet high. Two covers are used with each 52-foot gondola car. Send coupon for complete facts.

REPUBLIC STEEL

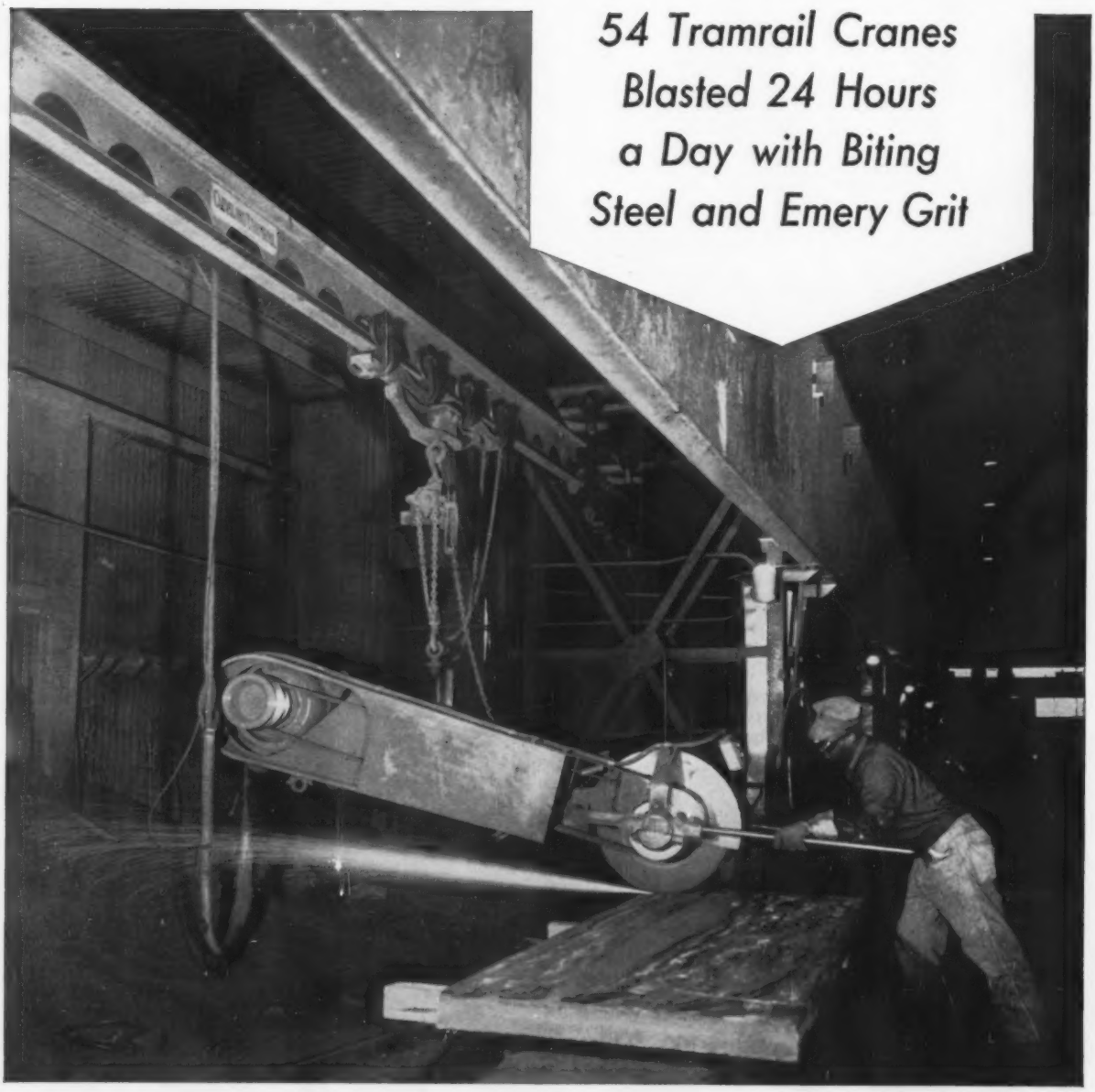
World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA-6803-A
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Send more information on:
☐ Manufacturers' Wire ☐ Coil Covers ☐ Steel Sheets
Have a metallurgist call:
☐ Wire ☐ Pig Iron

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

Talk About *Tough* Working Conditions



54 Tramrail Cranes Blasted 24 Hours a Day with Biting Steel and Emery Grit

FOR years Cleveland Tramrail cranes have been handling swing grinders at a large Pennsylvania steel mill.

Despite the continuous storms of fine, penetrating, corrosive dust, the cranes operate with negligible maintenance.

The design and quality of Cleveland Tramrail equipment is of importance for every job, but on the tough ones like this is where these factors quickly prove their worth.

Cleveland Tramrail cranes are particularly well suited for swing grinder operation because of their free easy movement in any direction. This permits flat grinding over a wide area and avoids "dishing" of grinder wheel into the metal. Easy crane operation greatly reduces worker fatigue.

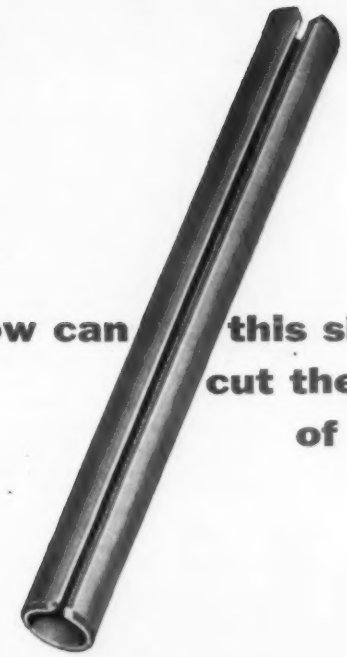
Write for free Engineering and Application Booklet No. 2008. Packed with valuable information.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

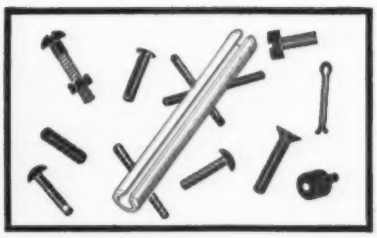
CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4821 E. 290 ST. • WICKLIFFE, OHIO

How can this simple fastener cut the cost of your product?



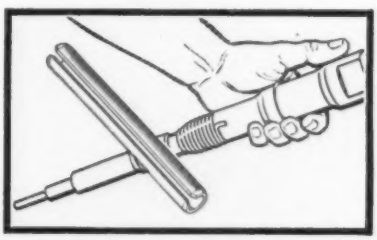
Rollpin aids standardization and reduces inventory

Rollpin readily replaces taper pins, grooved pins, straight pins and set screws; it can be used as a locating dowel, hinge pin, cotter pin, stop pin or, in some applications, even as a rivet. Thus, when you standardize on a Rollpin you can drastically reduce the variety of fasteners in your inventory—save money in purchasing, storage space and stock handling.



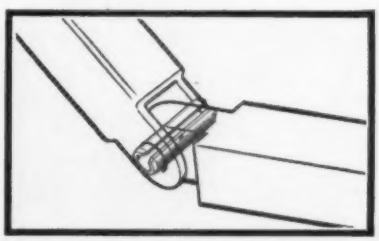
Rollpin simplifies production processing . . . saves man-hours

When you use Rollpin you can eliminate costly precision drilling, or tapping operations. And there's no need for any secondary locking operation—such as lock wiring or peening. That's because Rollpin is a slotted tubular steel spring whose chamfered ends drive easily into standard production-drilled holes, compressing as driven. The spring tension against the hole walls retains Rollpins securely against severe vibration. Independent studies have shown that installed costs of Rollpin are as much as *91% less* than those for a dowel pin or *95% less* than the installed cost of a taper pin.



Rollpin simplifies product maintenance

Only a drift pin or standard punch is required to remove a Rollpin. The slotted tubular shape and the spring action principle do not damage hole walls or enlarge the original hole diameter. Consequently the same pin is easily re-inserted and can be used again and again. Mail our coupon today for the complete Rollpin story.



ROLLPIN®

a product of
Elastic Stop Nut Corporation of America

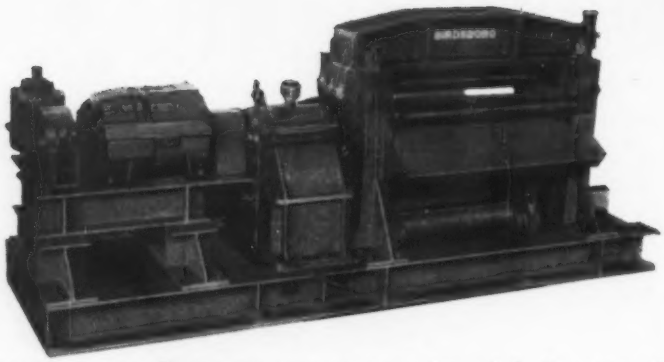
Dept. R58-1277, Elastic Stop Nut
Corporation of America
2330 Vauxhall Road
Union, New Jersey

Please send the following free fastening information
- ☐ Rollpin bulletin
- ☐ ELASTIC STOP® nut bulletin
- ☐ Here is a sketch of a fastening problem. What ESNA® fastener would you recommend?

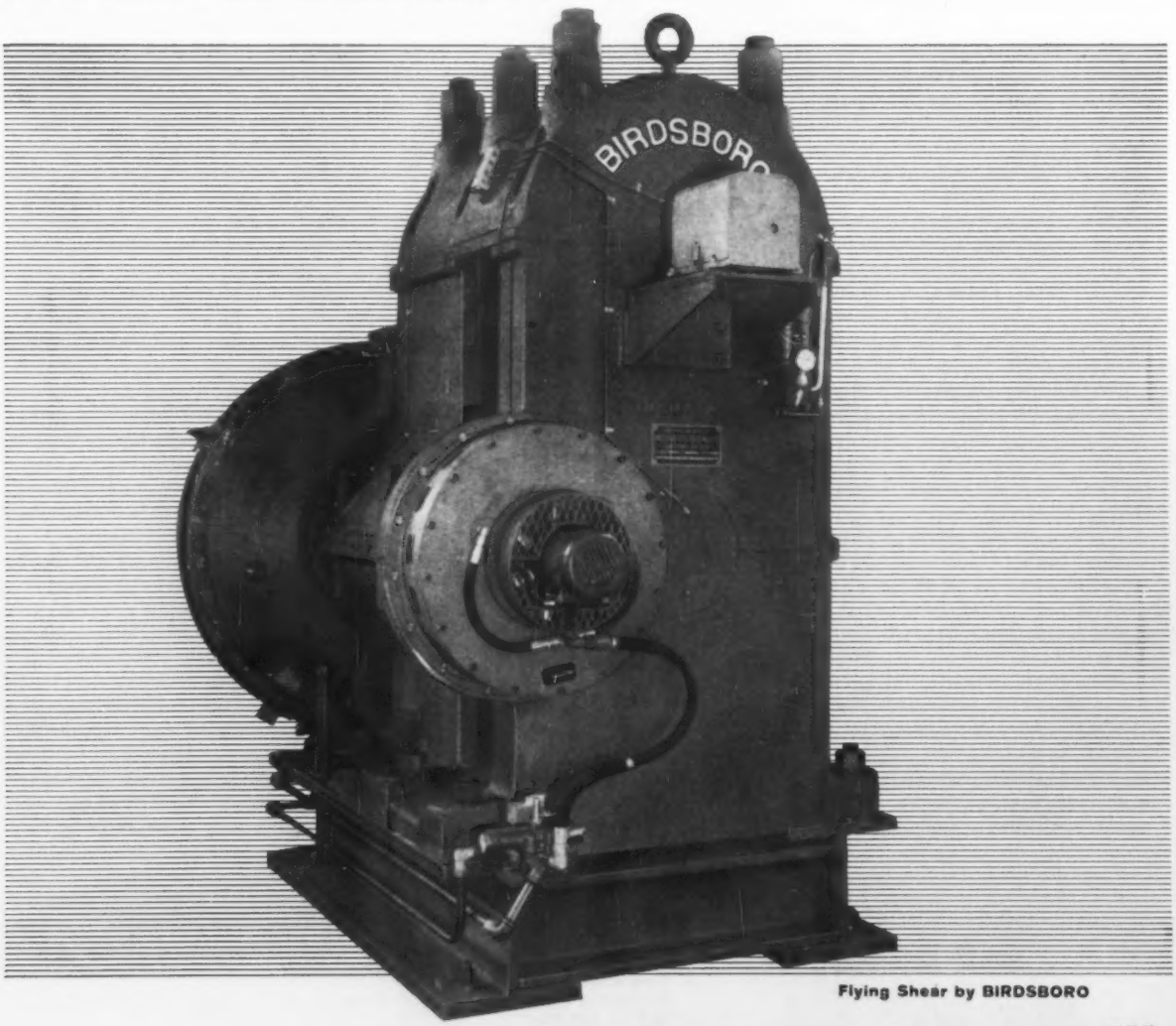
Name_____
Title_____
Firm_____
Street_____
City_____ Zone____ State____

BIRDSBORO

Customized Shear Designs pay off in higher productivity



● Like any other key piece of mill equipment, shears have been given a lot of BIRDSBORO's attention in recent years. As a result, many innovations are available to the mill operator that can eliminate former problems and provide a finer product at a lower cost. BIRDSBORO's shear case history book is a full one. In it you can see a number of firsts, some of them applicable to your operation. The BIRDSBORO representative can help apply creative engineering to your mill. *Sales Department, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.



Flying Shear by BIRDSBORO

MM 73-59

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

Chemical energy provides direct current

Power is furnished by a fuel cell in the Allis-Chalmers Research Laboratories. It points the way to remarkably efficient means of energy conversion in the future.

Unlike the conventional storage battery, the fuel cell converts the chemical energy of gases (at room temperature) directly into direct current. For the future the fuel cell promises a highly efficient source of power.

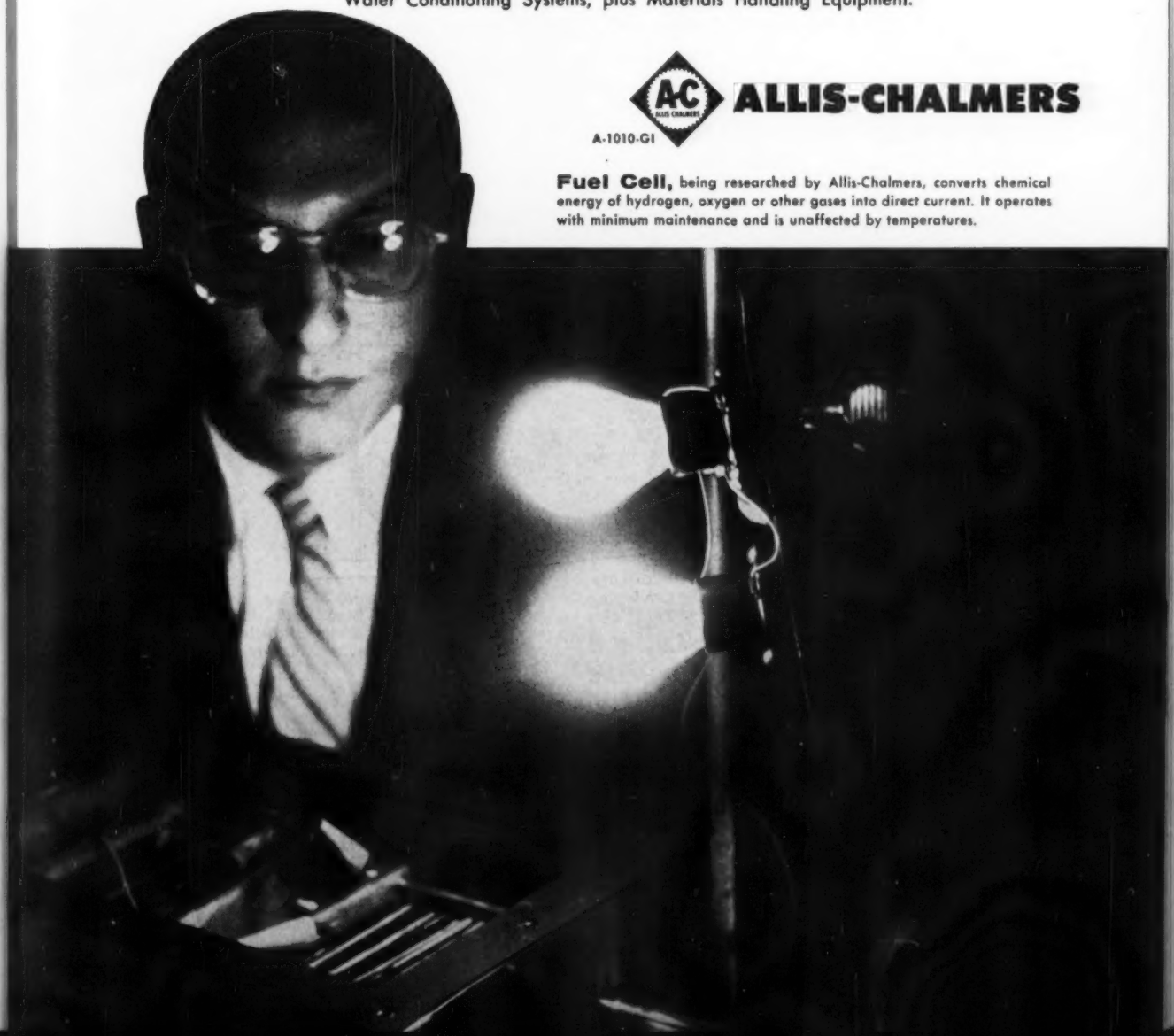
Fundamental research of this type serves *two* end results at Allis-Chalmers: 1) enables design engineers to make equipment even better; 2) helps every industry achieve new efficiencies and economies.

Research is only one area where A-C helps. Single-source availability of "teamed" equipment, maximum engineering assistance and outstanding service facilities are others. For more information, contact your A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

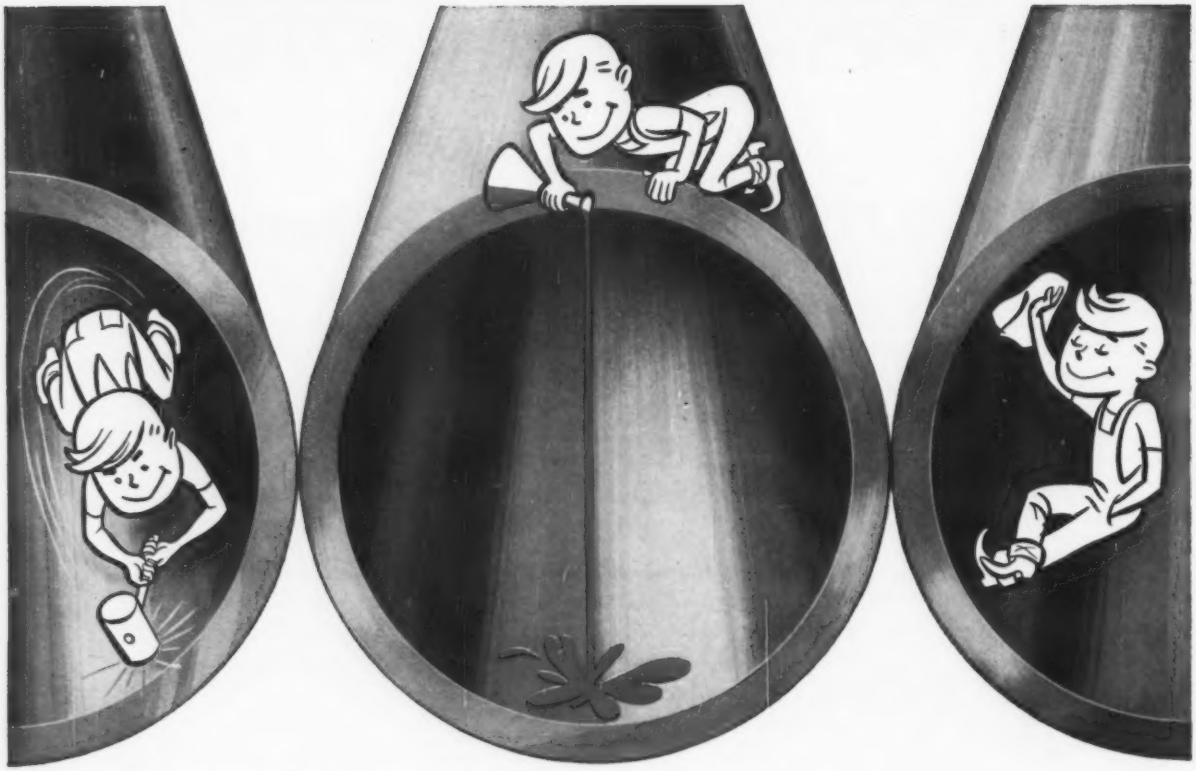
Products for Industry Electrical Generation, Distribution and Utilization Equipment; Pumps; Compressors; Mechanical Power Transmission Equipment; Processing Machinery; Motors and Control; Water Conditioning Systems, plus Materials Handling Equipment.

A-C ALLIS-CHALMERS

A-1010-GI



Fuel Cell, being researched by Allis-Chalmers, converts chemical energy of hydrogen, oxygen or other gases into direct current. It operates with minimum maintenance and is unaffected by temperatures.



The smoother surface of

CONTOUR-WELDED* STAINLESS TUBING

gives it greater resistance to corrosion

Recent tests prove: (1) *Contour-welded* tubing is smoother than any other tubing, and (2) this extra smoothness provides greater resistance to corrosion.

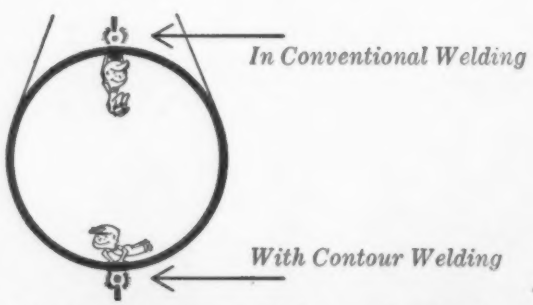
Here's how TRENTWELD® tubing, made by the exclusive *Contour-Weld* process, compares with other full-finished tubing:

- It's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless is extruded or pierced.
- It's smoother than other welded tubing because the *Contour-Weld* process, patented by Trent, virtually eliminates the weld bead.

Other tests prove this smoother surface provides *increased resistance to corrosion* — because there are fewer focal points for corrosive attack. Not only that, the smoother surface ensures *longer fatigue life* and *less product incrustation.*

But get full details. Our free 48-page *"Trentweld* Manual" gives complete data on *Contour-Welded* tubing in sizes from ⅛" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy and Hastelloy.† Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



In CONVENTIONAL WELDING of tubes, gravity pulls the molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

***With CONTOUR-WELDING the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.**

CONTOUR TRENTWELD

stainless and high alloy pipe and tubing

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.

New insulation adds years to motor life

Super-Seal motors withstand abrasion, physical stresses, moisture, heat aging

A drip-proof enclosure is usually all you need with the remarkable new insulating systems and advanced mechanical features of *Super-Seal* motors.

New motors are protected with the *Silco-Flex* stator coil insulating system: A homogeneous dielectric barrier of vulcanized silicone rubber possessing unmatched resistance to abrasives, moisture and most corrosive or chemical atmospheres.

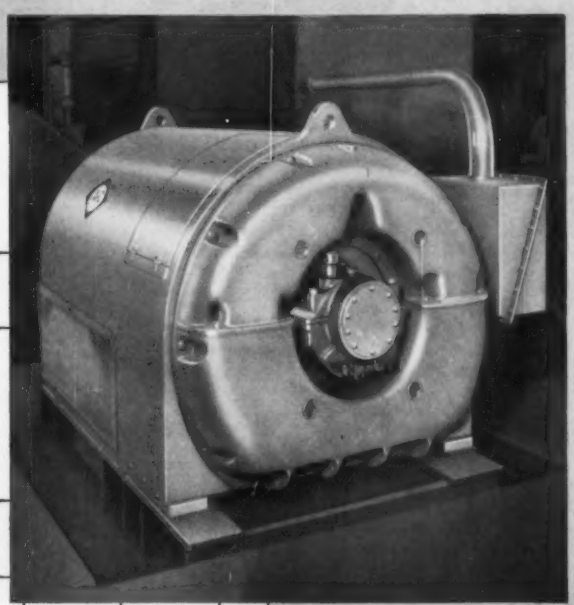
Synchronous machines have *integrated* field coils that seal against contaminants . . . bond and lock against mechanical forces.

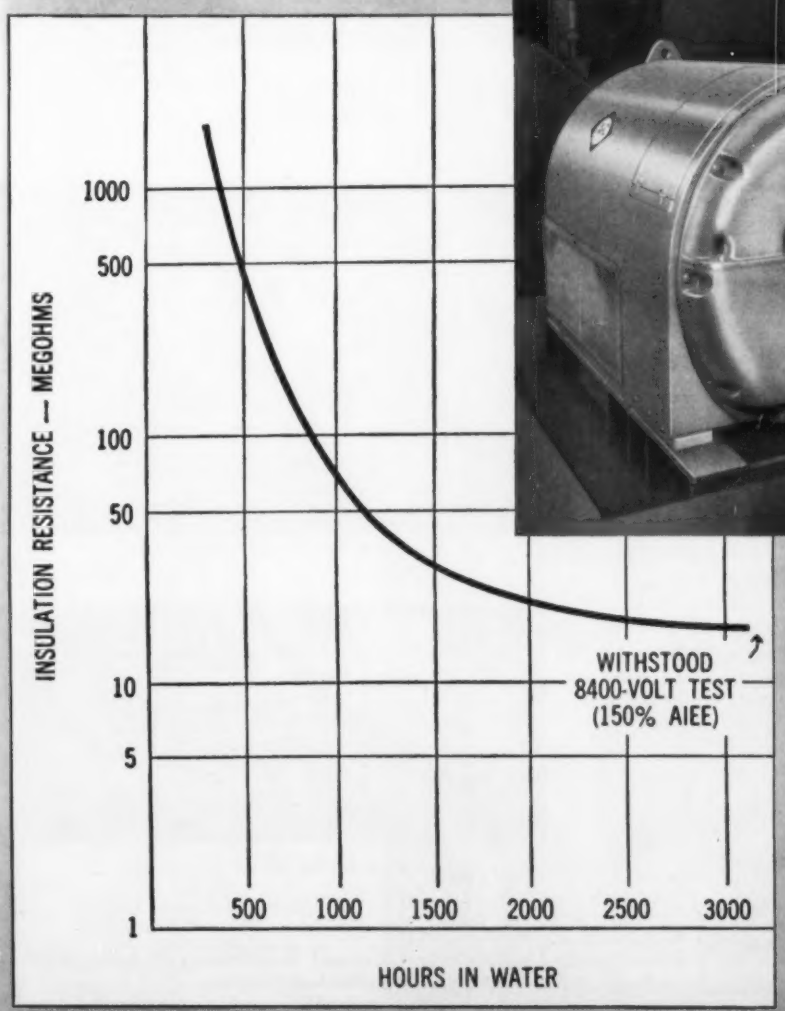
Contact your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

Super-Seal and Silco-Flex are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-5922-MW



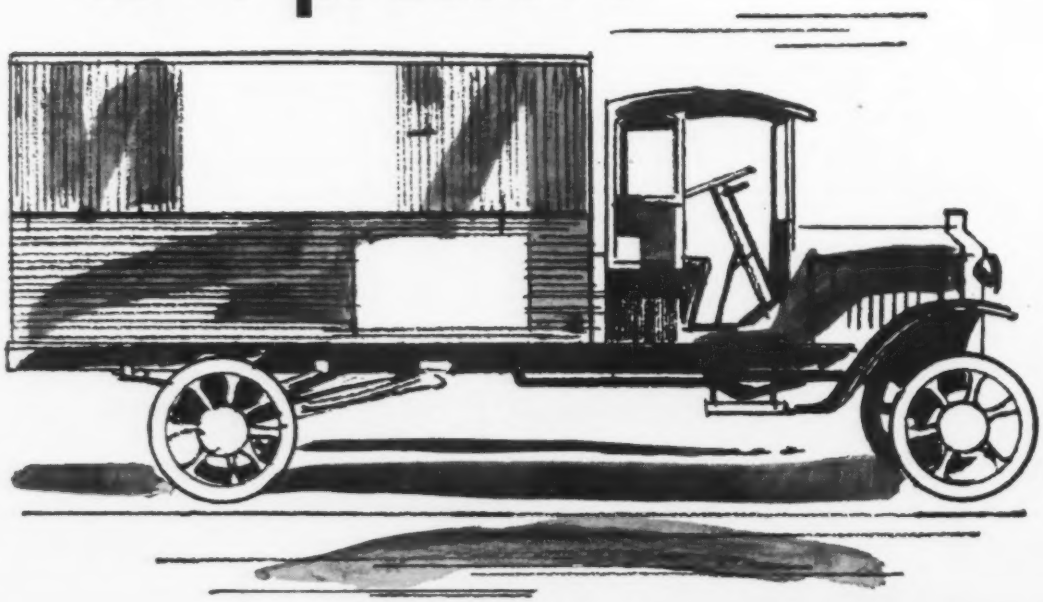


Silco-Flex Insulation | Polyester Mica Tape | Asphaltum Mica Tape

Sandblasting proves the difference! Only *Silco-Flex* insulation stood up after one minute using 90-grit aluminum oxide and 100-psi air from distance of 6 inches.

Chart shows insulation resistance in water of a 2300-volt *Silco-Flex* insulated coil, completely immersed with 2300 volts applied continuously.

Delivering lo$t profit$?



You can't afford to deliver your goods in obsolete equipment; that would be poor economy and tough on your name.

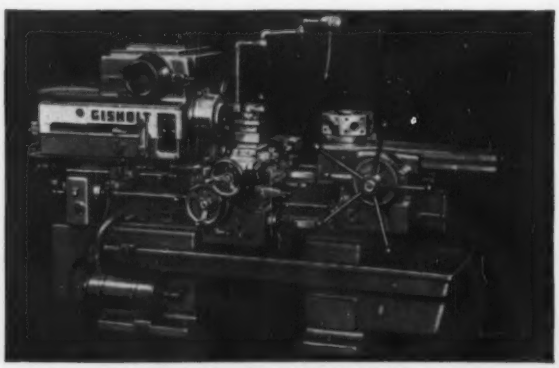
But what about obsolete production equipment? It's out of sight, but it delivers a far greater loss in wasted time and manpower, excessive unit costs and reduced quality.

You might be surprised how easy it is to turn these losses into profits with the many production advantages of a modern Gisholt Turret Lathe.

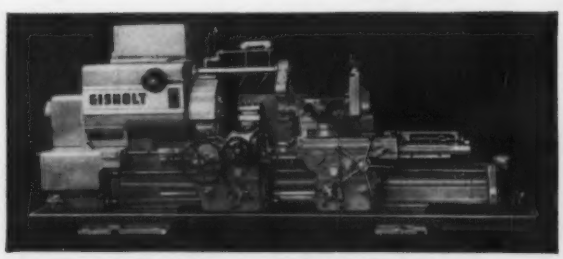
Here is the capacity with the versatility you need to cut critical unit costs on a wide variety of tough jobs. Here is the easy operation you need with the easy setup to minimize tooling and change-over time. Here is the extreme accuracy you need to maintain closest tolerances and highest quality. Here is the extra power with the rigidity to take full advantage of modern cutting tools.

Here are all the advantages you need to keep ahead of demands for higher, faster production and lower costs.

Ask your Gisholt Representative about Gisholt Ram and Saddle Type Turret Lathes—how they can be put to work in your plant earning extra profits, paying for themselves. Call him today or write for literature.



Gisholt Ram Type Turret Lathe



Gisholt Saddle Type Turret Lathe

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Machines • *Factory-Rebuilt Machines with New Machine Guarantee*

CORRECT APPLICATION is the key to semi-conductor rectifier efficiency

Sure, you're looking for the high conversion efficiency, low maintenance and simplified operation associated with semi-conductor rectifiers. And you'll get all these advantages — and more — if the semi-conductor rectifier is a right-for-the-job installation.

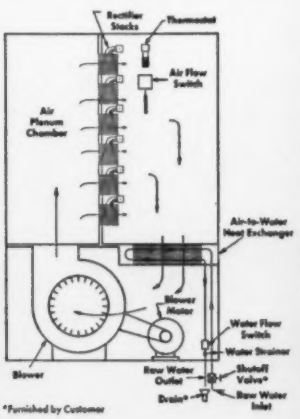
Your local Allis-Chalmers man will be glad to tell you whether *or not* a semi-conductor rectifier is best for your specific operation. He can afford to be completely unbiased in the approach to your problem because Allis-Chalmers makes *all types* of power rectifiers. At his disposal, and yours, are vast research and engineering facilities. Behind his recommendations is the assurance found in the fact that Allis-Chalmers has been developing, building and applying rectifiers for almost 25 years.

For complete information, call your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

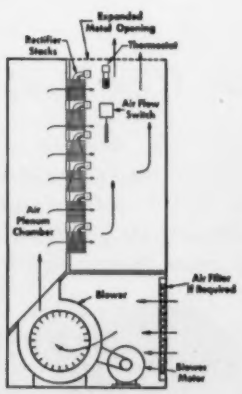
ALLIS-CHALMERS

A-3950-MW

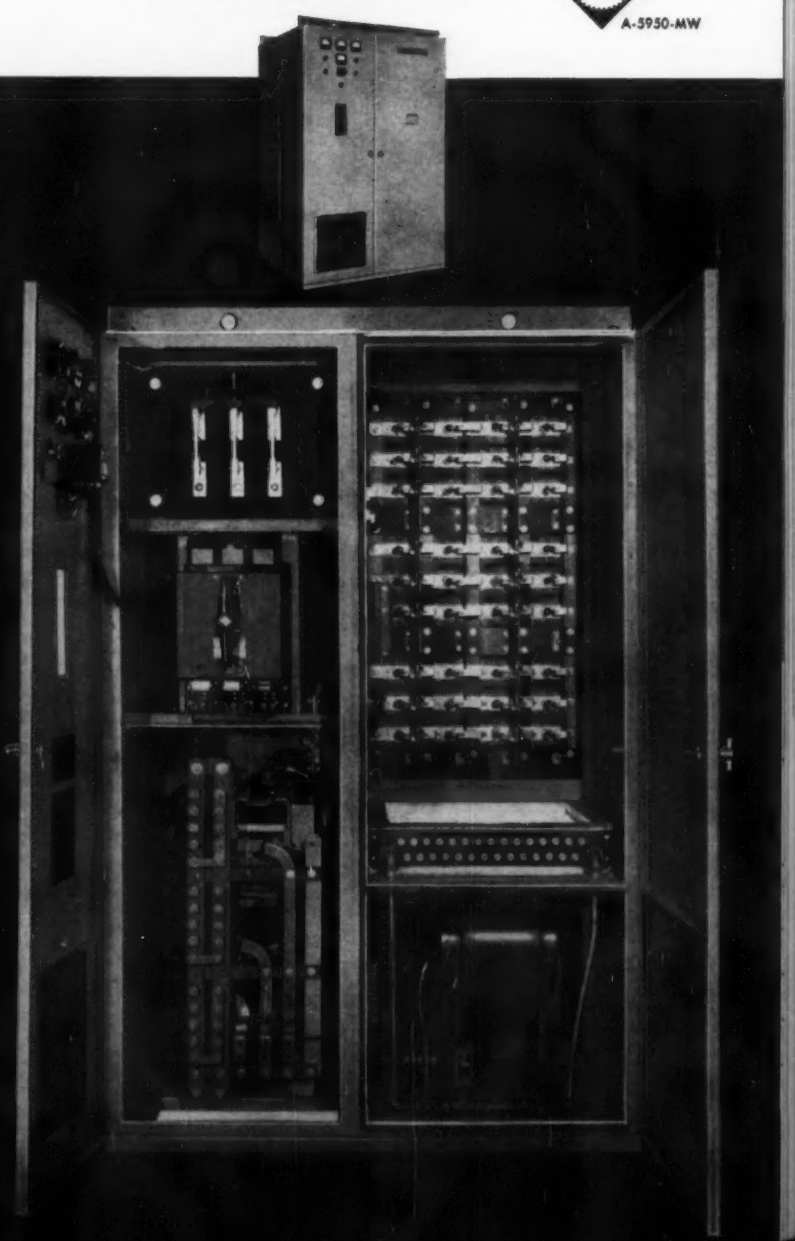
CHOICE OF COOLING SYSTEMS



A recirculating air system featuring an air-to-water heat exchange is employed where atmosphere is corrosive or dusty.



A simple air-cooling method is recommended for use in near normal atmospheres and where water is not available.



YOU'LL GET WATCH MAKER'S PRECISION WHEN YOUR "SPECS" READ HYATT

Holding roller diameter variation to 50 millionths of an inch is neither impossible nor impractical for Hyatt. With the help of automated precision equipment, we do it every day. For it takes precise and exacting care to build unsurpassed reliability into a Hyatt Hy-Roll bearing. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT *HY-ROLL BEARINGS*

Replacement bearings available through United Motors System and its authorized bearing distributors.

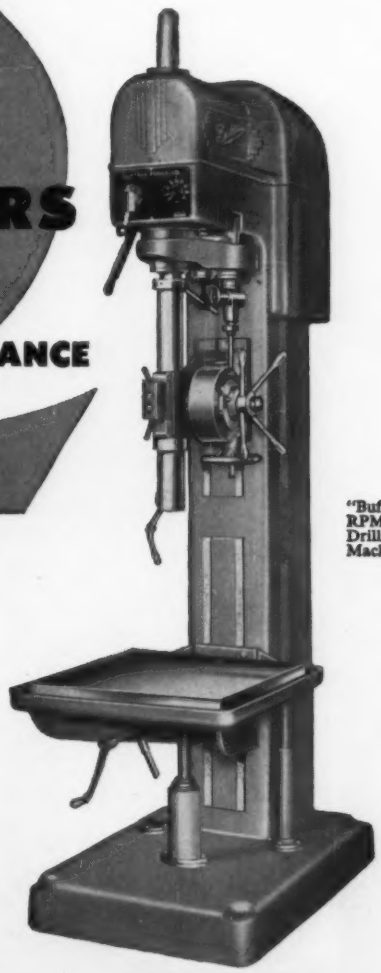
IN ROLLER BEARINGS HYATT IS THE WORD FOR GM GENERAL MOTORS RELIABILITY

"6-in-1" Machine Pays for Itself—Fast!

"Buffalo" Universal Iron Worker

For production shops, or for those with maintenance work, the "Buffalo" Universal Iron Worker takes the space of only **one** machine (and requires only a **one**-machine investment) yet it does the work of **six** machines. It's a great space-, time-, work- and money-saver. The UIW rapidly notches, punches, shears, miters, slits, cuts, copes. It handles angles, tees, channels, bars and flats at fast production rates. Performs up to three jobs at once, thus saving time and labor. Ruggedly built with heavy welded steel frame for dependable service. See how the "Buffalo" Universal Iron Worker can save money for you! Write for Bulletin 360-G.

2 MONEY-MAKERS FOR PRODUCTION OR PLANT MAINTENANCE



"Buffalo" RPMster Drilling Machine

Drilling Speed Changes Unlimited!

Since "Buffalo" pioneered the "RPMster" it has earned an industry-wide reputation as the outstanding variable speed drilling machine. Now, new improvements make this versatile drill even more productive and profitable to use. One is the exclusive "Buffalo" Torque Controlled Power Feed. This permits maximum speed and feed for the size hole being drilled without concern over damage to drill or machine gearing. The "RPMster" has been redesigned for greater capacities, ranging from 1" to 2" in mild steel. For a revelation in drilling ease, smoothness and high productivity, be sure to investigate the "Buffalo" RPMster. Write for Bulletin 3257-B.

For complete facts on these "money-making machines", call your "Buffalo" machine tool dealer. Or write us direct.

BUFFALO FORGE COMPANY

492 Broadway • Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING **PUNCHING** **SHEARING** **BENDING**

A beauty of a buy!
Black & Decker
25
New High Styled Heavy-Duty
BLACK & DECKER VACUUM CLEANERS

Black & Decker Heavy Duty Vacuum Cleaners designed to suit your every need

Take the new No. 25 Heavy-Duty, for example. Here's *whisper-quiet* cleaning in a new concept of industrial vacuuming. The 25's swivel top permits cleaning a 15′ circle without moving the vacuum. And when the job's done just throw away the disposable bag! With power to spare the No. 25 is the most compact heavy-duty vacuum on the market.

Other models, ideal for general office, factory and furnace room use, are the No. 35 (⅜ bushel capacity); No. 65 for wet and dry cleaning; No. 95 for extra capacity and power. No. 55 for super capacity (50 gallons); and No. 648, designed for efficient furnace cleaning.

Whatever your cleaning needs call on B&D power, capacity, quietness. See the line soon. Mail coupon for free demonstration.

Capacity plus Power
. . . No. 95

Super-Capacity Cleaning
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50th YEAR

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☐ Please arrange a demonstration of _____
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Name _____ Title _____

Company _____

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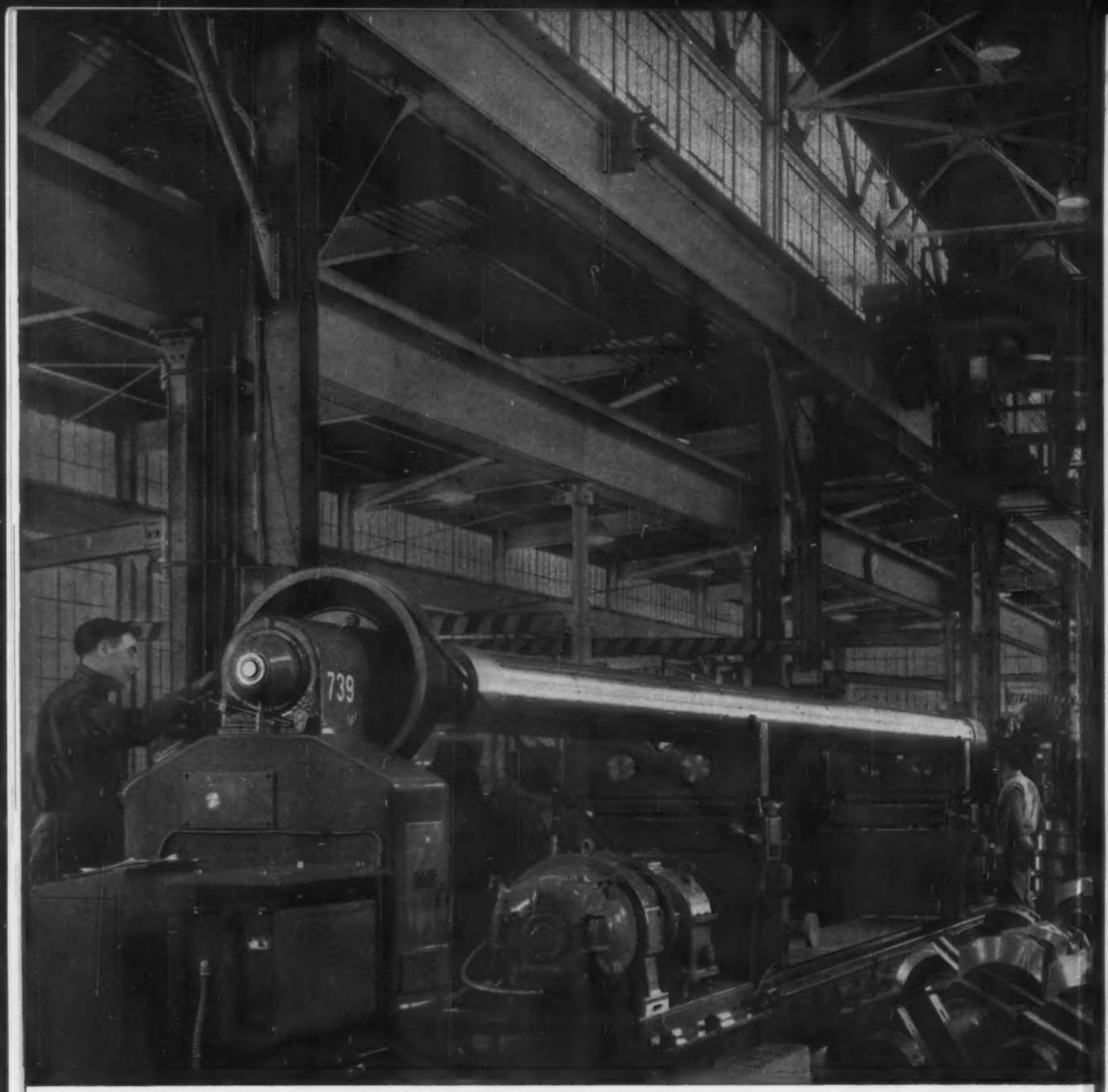
City _____ Zone _____ State _____

☐ Drills ☐ Saws ☐ Scrugun® ☐ Belt Sanders



WHO FORGES THE TOUGH ONES?
and dynamic balances them, too?

To further National Forge's reputation for producing precise forgings, we've installed one of the largest, most accurate dynamic balancing machines in use. Our American-Trebel has a 33,000-pound, 60-foot capacity.

Pictured on the machine is a 42 ft. propeller shaft that has been forged, machined, and hollow bored—all operations done in our National Forge plant NF specialists are shown balancing this gigantic 15,500 lb. shaft.

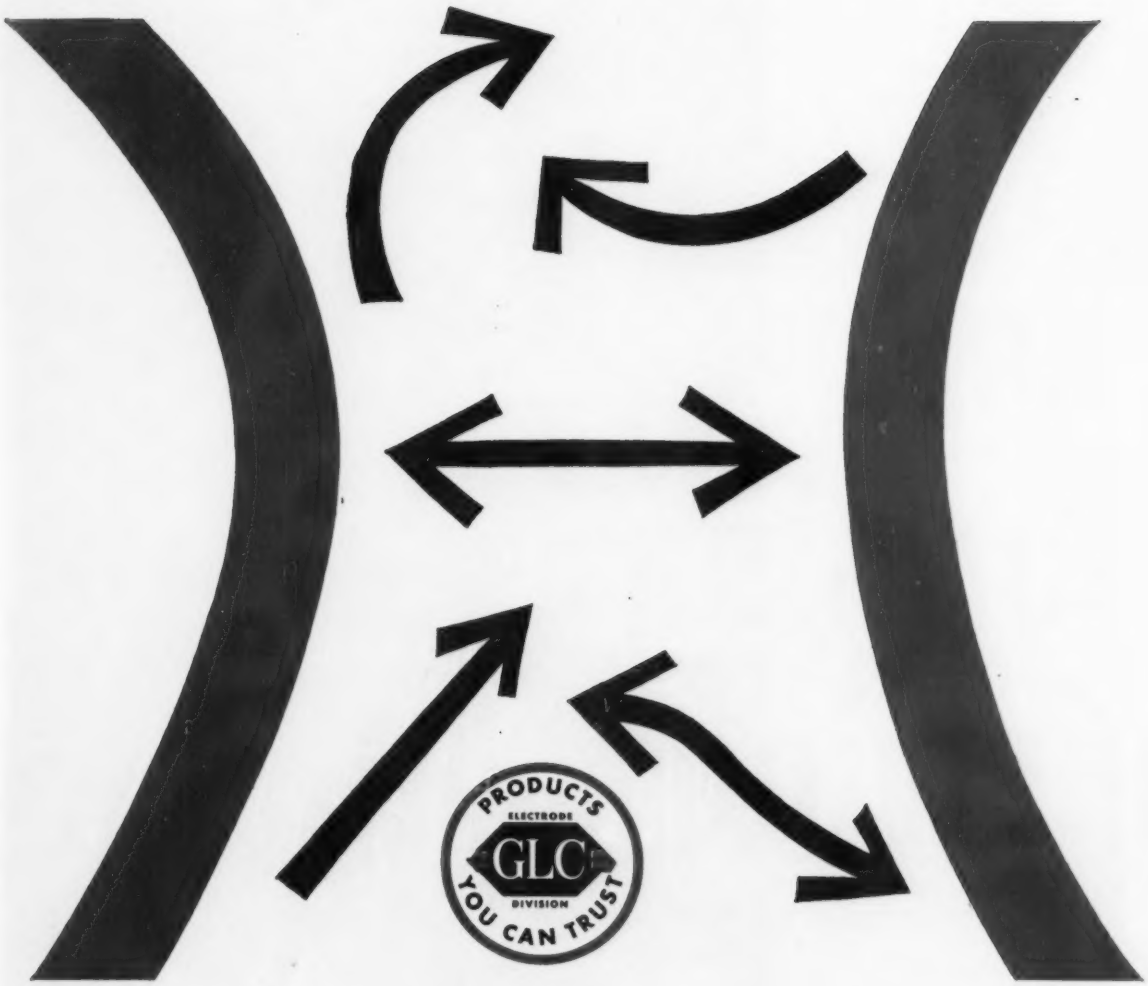
If you want one responsible source to produce and control the quality of your forgings. .from melting and forging the steel through machining and dynamic balancing... call National Forge. Let us quote on your next job—and *prove* "who forges and dynamic balances the tough ones . . . best!".

NF

NATIONAL FORGE COMPANY
IRVINE, WARREN COUNTY, PA.

NF-59-04

For information on the "tough" ones and the machinery that makes them best, write for Bulletin NF 1.



CLOSE COOPERATION

• • • with melt shop personnel by GLC service engineers is one of the reasons for the outstanding performance of GLC electrodes. Don't hesitate to avail yourself of this service.

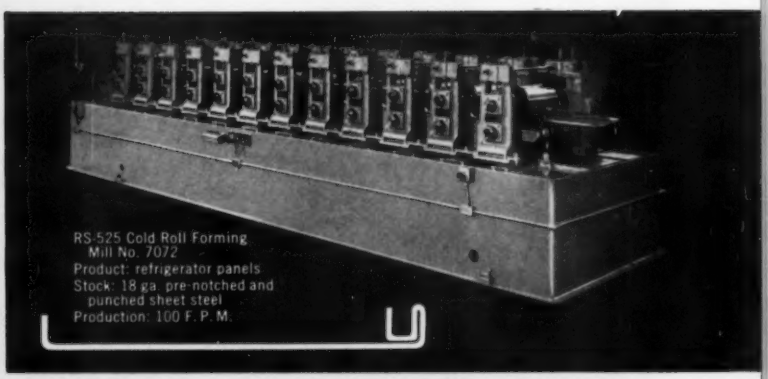
GREAT LAKES CARBON CORPORATION

18 EAST 48TH STREET, NEW YORK 17, N. Y. OFFICES IN PRINCIPAL CITIES

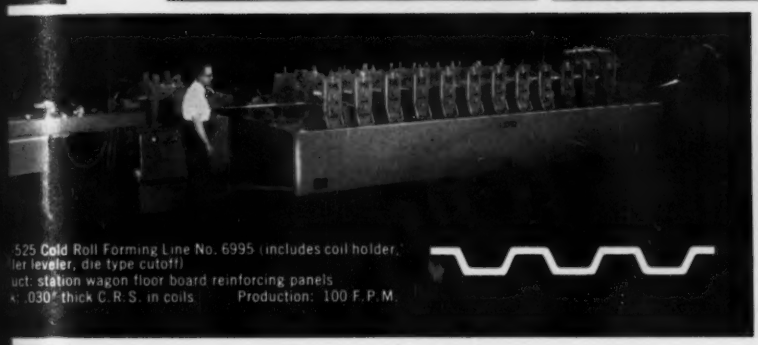
Roll forming upswing.....

Recently installed in the plant of one of America's leading steel companies was this McKay cold roll forming line for the forming and cutting to length of industrial shelving angles up to .116" mild steel strip with pre-notched holes for joining. Line is composed of double rotating coil holder, roller leveler, pre-notching press, forming machine, cut-off, run-out and kick-off table.

Completely Automatic Rim Rolling Line No. 6798
Product: automobile and farm implement drop center wheel rims
Stock: welded steel bands
Production: 600-900 Rims per hour



RS-525 Cold Roll Forming Mill No. 7072
Product: refrigerator panels
Stock: 18 ga. pre-notched and punched sheet steel
Production: 100 F.P.M.



525 Cold Roll Forming Line No. 6995 (includes coil holder, ler leveler, die type cutoff)
uct: station wagon floor board reinforcing panels
.030" thick C.R.S. in coils Production: 100 F.P.M.

WRS-653 Cold Roll Forming Line No. 7229 (4) (includes coil holder, roller leveler, die type cutoff)
Product: bar joist channels
Stock: ⅛" to ¼" thick h.r. low-carbon steel in coils
Production: 100 F.P.M.

WRS-420 Cold Roll Forming Line No. 7118 (includes coil holder, roller leveler, pre-notching press, die type cutoff)
Product: structural angles and channels
Stock: 16 ga. to 11 ga. h.r. and c.r. low C steel in coils
Production: 100 F.P.M.

Manufacturers of all kinds of products look to McKay Machine for roll forming equipment to lower man-hour costs!

To increase man-hour production, manufacturers are turning to the automated roll forming line. In recent years McKay Machine engineers have developed equipment that enables fabricators to produce more and more products in a continuous stream directly from coiled stock.

From drop center wheel rims and station wagon floor boards to finished refrigerator parts, manufacturers are finding roll forming gives them greater production control and product uniformity while eliminating many costly intermediate manufacturing functions.

Analyze your production—there may be a way you can take advantage of roll forming economies. To help you, why not rely on the 20 years of roll forming leadership of the *McKay Machine Company, Youngstown, Ohio.*

McKAY MCK MACHINE

Physical tests at Standard include those for special properties of steel alloys under extreme variations in temperature. Here, the strength and ductility of steel are being checked for resistance to stress under severe conditions of elevated temperatures over a prolonged period of time.

Charpy impact and transition temperature determinations have recently assumed importance in many applications. Here a steel sample is immersed in liquid nitrogen to determine its susceptibility to fracture at temperatures as low as —300°F.

Quality control—a vital activity at Standard Steel Works

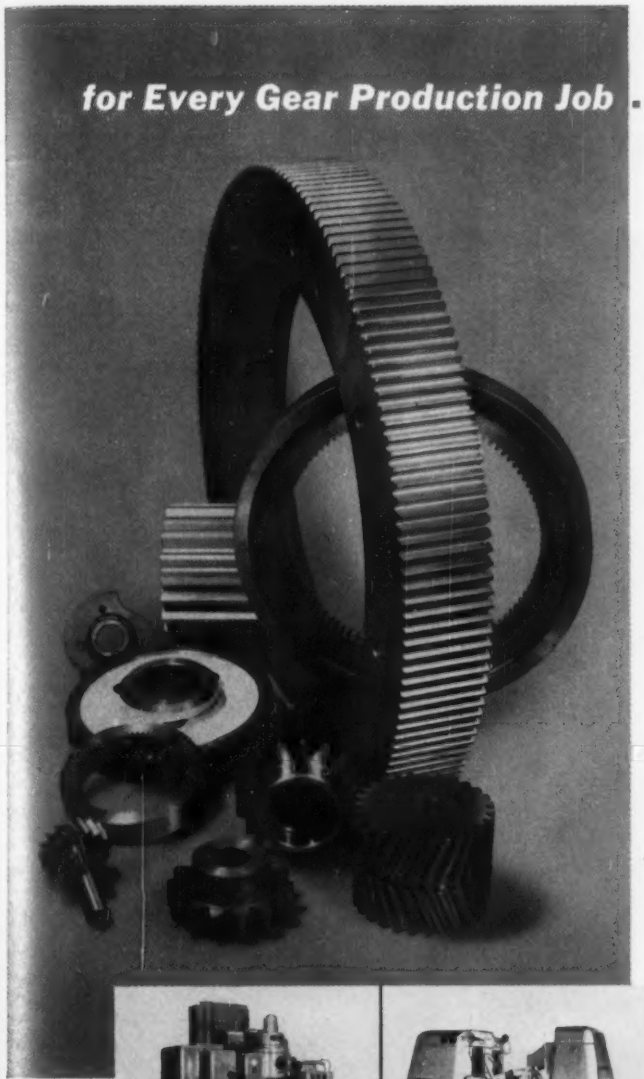
Every conceivable shop and laboratory test required for modern quality control can be performed by Standard's staff of metallurgical technicians. Testing of incoming raw materials; physical property tests of steel and other alloys at temperatures from several hundred degrees below zero up to red heat; gas analysis, ultrasonic, X ray, magnetic particle, fluorescent penetrant and microscopic examination of finished products are routine checks which assure that the finished, delivered product will meet the most rigid specifications. Write Department 1-L for full details.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

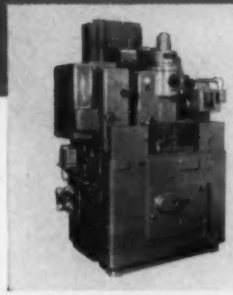


for Every Gear Production Job . . . Fellows Has the Equipment to Shape, Hob, Grind and Inspect

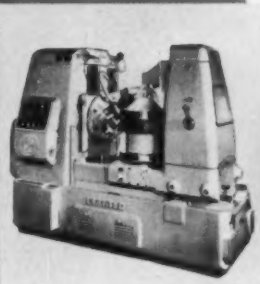
Right from the blank to the finished external or internal spur or helical gear, Fellows has the complete line of gear production and inspection equipment to meet all your requirements!

No other builder in the world offers as long and varied a line: Fellows Gear Shapers; Pfauter Gear Hobbers; Fellows-Reishauer Gear Grinding Machines; Fellows Gear Inspection Instruments; Fellows special machines and attachments; Fellows Gear Shaper Cutters. All this, *plus* the benefit of our sixty years of specialized experience in solving gear production problems.

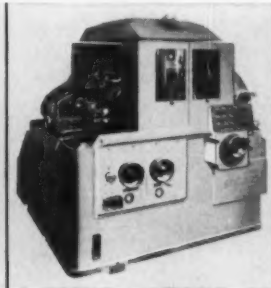
Ask your Fellows representative for information on the complete line of Fellows gear production and inspection equipment. If you have a problem requiring special equipment, ask him to help you solve it, or write direct.



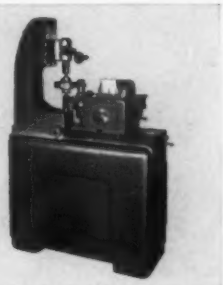
Fellows Gear Shapers cut internal and external spurs and helicals; capacities to 120″ P.D.



Pfauter Gear Hobbing Machines for spur and helical gears; capacities to 120″ P.D.



No. 12 Fellows-Reishauer Gear Grinding Machines grind spurs and helicals to 12″ O.D.



No. 20M Fellows Red Liners make and record the "composite check" of spur and helical gears to 18″ P.D.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont

Branch Offices:
1048 North Woodward Ave., Royal Oak, Mich.
150 West Pleasant Ave., Maywood, N. J.
5835 West North Avenue, Chicago 39
6214 West Manchester Ave., Los Angeles 45

THE PRECISION LINE

Fellows *Gear Production Equipment*

Here's why you save $60 in maintenanc a

Ordinary brakes need frequent adjustment . . .

Ordinary magnetic brakes require periodic adjust-
ment to compensate for wear . . . industry averag
is once every two weeks. New Westinghouse S
brakes are completely self-adjusting . . . auto-
matically adjust themselves *during* operation. Onc
they're installed, you never have to touch them.
This means you save at least $60 per year pe
brake *in maintenance alone.* And that's not all . . .

a year with every Westinghouse SA brake

Westinghouse SA brakes adjust themselves . . . automatically

Westinghouse magnetic brakes also offer you these important benefits: 1) dust-tight enclosure which eliminates cleaning of dust, dirt and metal particles . . . 2) automatic self-alignment which substantially reduces installation time . . . 3) safe, sure protection against dragging shoe tips and uneven lining wear, eliminating costly replacements.

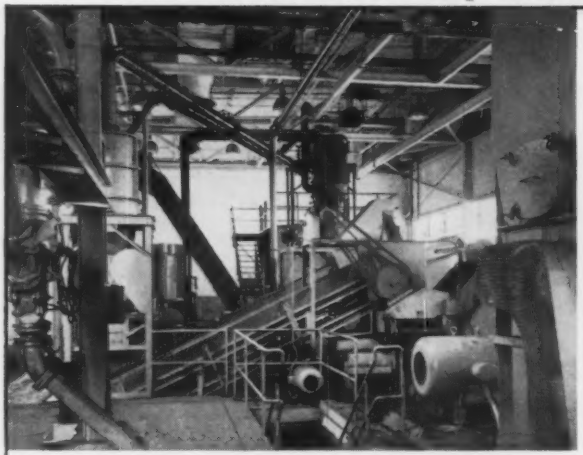
Ask your Westinghouse representative about the many ways this new brake can benefit you. Or, write Westinghouse Electric Corporation, P.O. Box 868, 3 Gateway Center, Pittsburgh 30, Pa. Ask for Booklet B-6548. J-22114

YOU CAN BE SURE...IF IT'S

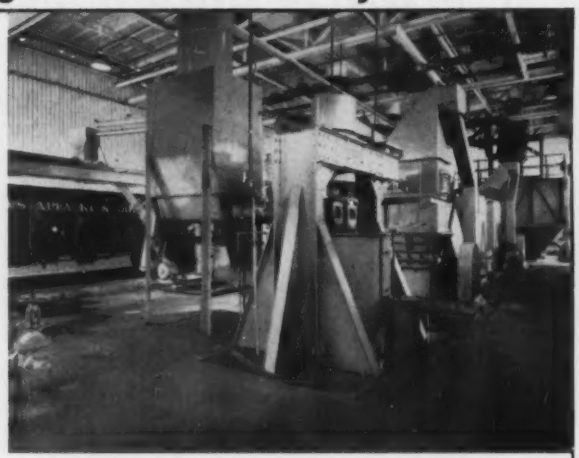
Westinghouse

How to Make Chip Handling a Profitable Operation

with National Metal Chip Handling and Oil Reclamation Systems



▲ This view shows the efficient, National-equipped chip room in one of the nation's large automotive parts plants.



▲ Comprehensive chip handling system showing suspended-type continuous chip wringer in foreground.

◀ Storage bin for malleable iron chips received from vacuum-type pneumatic conveyor system. Bin discharges to railroad cars by means of National Combination Horizontal-Vertical Elevating Conveyor.

▶ Storage bin loading crushed dried steel chips into railroad gondola car. Pneumatic Chip-Veyor feed line shown in foreground.

A National system may give you your biggest single cut in costs! Here are quotes from our mail: "Saving $300 daily in scrap handling cost alone!" . . . "Saved $15,850 in 3 months on reclaimed oil!" . . . "$40,000 scrap disposal unit paid off in one year!"

These savings are reported by companies in various types of industry, such as Ford, General Motors, Fafnir Bearing Co., Standard Pressed Steel Co., Chicago Pneumatic Tool Co., Fairfield Mfg. Co., Otis Elevator, and General Smelting Co.

National makes equipment to handle all forms of metal chips and borings . . . steel, stainless steel, cast iron, aluminum, brass or copper. Special equipment has been designed to solve almost every problem in the handling of scrap metals and cutting oils from the large production plant to the job shop operation with a single or group of machine tools.

National Systems are also used for the removal of punch press scrap and the handling of small parts such as cartridge cases, bearing cages, etc.

Send for National's free Bulletin C-56 today . . . consult our catalog in Sweet's Machine Tool Catalog File . . . or contact our nearest representative.

National CONVEYORS COMPANY INC.
FAIRVIEW, BERGEN COUNTY, N. J.
WHitney 5-9136

Also manufacturers of **Ash Conveyor Systems** (Send for Bulletins P57-A and H57) and **Pneumatic Systems** for handling granular materials (Bulletin P-58G)

REPRESENTATIVES

ATLANTA 3, Ga.—P. H. Nichols & Co.—400 Whitehead Bldg. • **BALTIMORE 18, Md.**—Lamb Engineering Co.—2125 Maryland Ave. • **BOSTON 94, Mass.**—Mills Engineering Co., Inc.—300 First Ave., Needham Hts. • **BUFFALO 2, N. Y.**—Charles P. Hague, Inc.—625 Delaware Ave., Rm. 202 • **CHARLOTTE 9, N. C.**—E. L. Mountcastle—2617 Selwyn Ave. • **CHICAGO 4, Ill.**—Burke & Colston (Ash)—53 W. Jackson Blvd. • **CHICAGO 5, Ill.**—Mayer & Oswald (Chip)—407 S. Dearborn St. • **CINCINNATI 27, Ohio**—Smith E. Hughes—3716 Petoskey Ave. • **CLEVELAND (Lakewood 7), Ohio**—J. Harry Haywood—12031 Edgewater Dr. • **DETROIT (Ferndale 20), Mich.**—Beltaire-Drissen—570 Livernois Ave. • **HARTFORD, Conn.**—Dee Engineering Co.—Cromwell, Conn. • **HOUSTON 5, Texas**—Industrial Handling Engineers—1200 Bissonnet • **LOS ANGELES 13, Calif.**—W. F. Huff and Co.—417 S. Hill St. • **PHILADELPHIA, Pa.**—C. V. McQuary—P.O. Box 52, Cheltenham, Pa. • **PITTSBURGH 29, Pa.**—Gibson & Stanier Engineered Products—P.O. Box 9742 • **ST. LOUIS 22, Mo.**—Medor, Inc.—10408 Manchester Ave.

Quality in Ascendancy

The superiority of the vast number of products that are—and can be made from Roebling Cold Rolled Flat Spring Steel is a fact known throughout all industry.

You pay for mechanical and dimensional uniformity when you buy flat spring steel...you *get* it when you buy Roebling.

For information on how our products can help *yours*, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities

Subsidiary of The Colorado Fuel and Iron Corporation

Roebling...Your Product is Better for it

Storage bins into which sand ingredients are conveyed by a Fuller-Kinyon Conveying System. Note the pipe-line system which permits ingredients to be conveyed into their respective bins.

One of two Fuller-Kinyon Pumps which convey sand ingredients to storage bins and from bins to mixers.

FULLER-KINYON CONVEYING SYSTEM HANDLES THREE DIFFERENT MATERIALS EFFICIENTLY, WITHOUT WASTE

To reduce costs and speed up handling of foundry sand ingredients with minimum waste, General Steel Castings Corporation, Granite City, Illinois, installed a Fuller-Kinyon Conveying System.

Here's what it does for them—

The system unloads corn flour, silica flour and bentonite from hopper bottom cars by means of Fuller-Kinyon Pumps which convey these materials through pipe lines to a number of storage bins. The flexibility of the system makes it possible to unload cars in a fraction of the time that would be required manually, *and*, waste due to spillage is eliminated. Two pumps used in the operation can be moved on narrow gage tracks for spotting under cars or bins. One pump is used mainly for unloading and delivery to storage—the other for delivery from storage to supply bins above the mixers. However, it is possible to unload cars and reclaim from storage simultaneously. Where bins are located so that they cannot discharge directly to a pump, an F-H Airslide® conveys from bins to the pump.

Prior to the Fuller installation, material was received in bags and manually unloaded, stored and transported to the mixers. It figures—*costs were much higher*. Now, waste has been eliminated! Another important feature—the company has realized extra savings by purchasing materials in bulk.

Fuller air-conveying systems are in operation in hundreds of plants throughout industry, cutting costs and increasing profits, day in and day out. The next time you have a materials-handling problem, why not get in touch with Fuller . . . chances are you will also profit.

FULLER COMPANY GENERAL AMERICAN TRADE MARK

Fuller

. . . . pioneers in harnessing AIR

FULLER COMPANY P-168 4038

122 Bridge St., Catasauqua, Pa.

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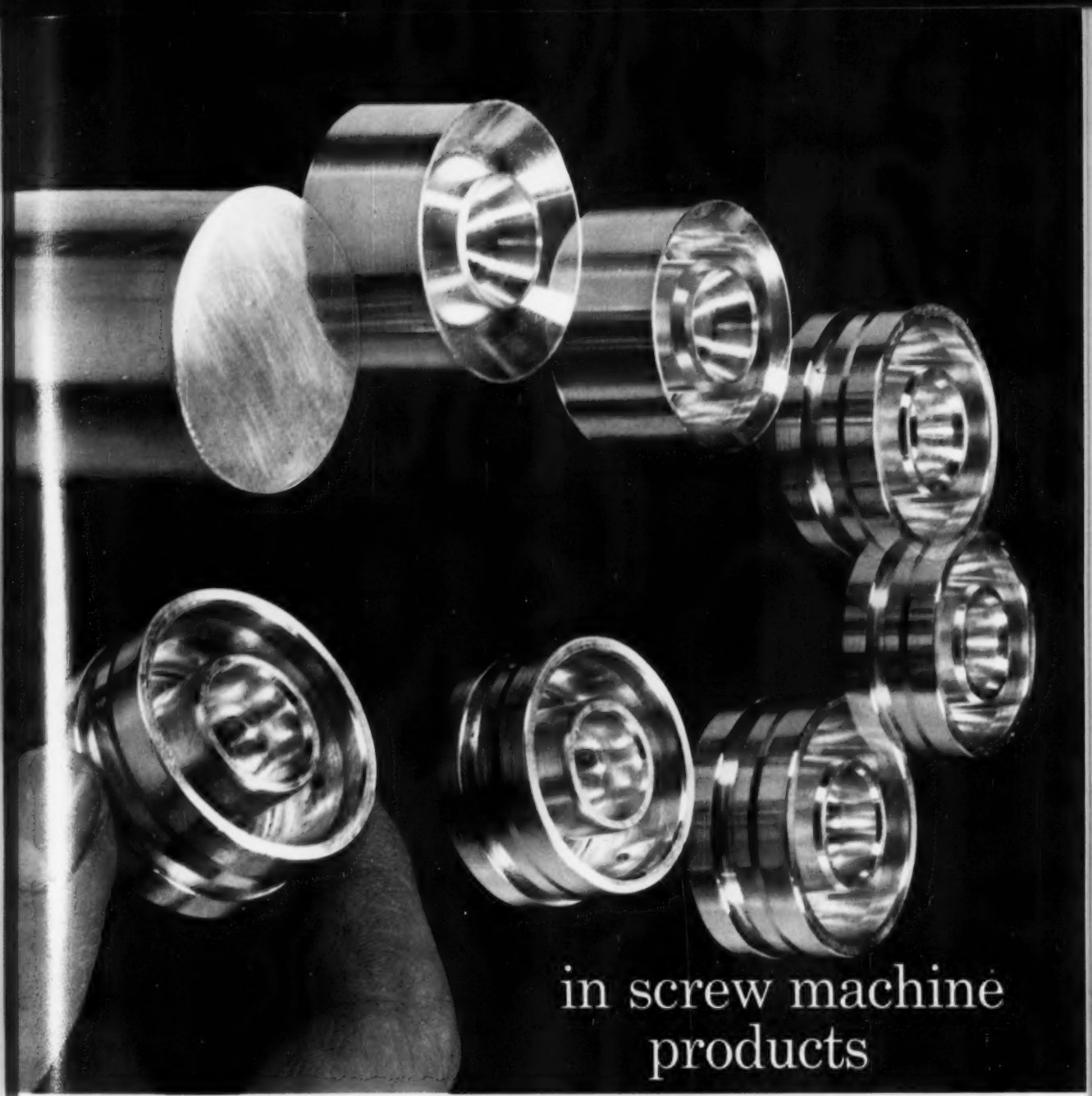

Alcoa puts the metal where you want it

This aluminum piston for an automotive air-conditioning compressor shows how far Alcoa goes to put the metal where you want it. Not just in primary screw machine operations, complex and demanding as they were, but on through a series of exacting secondary operations that enabled us to deliver a completely finished part.

Using 1 7/16-in. diameter 2014-T4 cold finished bar on a six-spindle automatic, we handled the forming, trepanning, drilling, facing and counterboring. Then we tackled the rest of the job—drilling and deburring two 1/16-in. cross holes. This was followed by coining the ball seat at a specified tonnage in order to insure proper assembly without distortion. Centerless grinding was then performed to a total tolerance of half a thousandth of an inch (plus or minus 0.00025 in.). All finished? Not by our standards. After final inspection, we cleaned every piece and packed it with meticulous care to prevent damage in transit, insuring safe and sound arrival.

Whether it's screw machine parts, forgings, castings, extrusions or impacts, Alcoa can put the metal where you want it—precisely and economically. The payoff may be fewer rejects, new flexibility in design, less waste in production, a best-selling product—or all four. To draw on Alcoa's file of ideas and Alcoa facilities, write today: Aluminum Company of America, 920-K Alcoa Building, Pittsburgh 19, Pa.

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Your Guide to the Best in Aluminum Value

REVOLUTIONARY AO FACE SHIELD BOTH VENTILATES AND PERMITS A CLEAR LOOK AHEAD!

Tempering chain saw bars after heat treating. Operator wearing AO "Kool-Vent" Face Shield has clear view of the work. Hands are heat protected by AO Silvabestos Gloves.

Photos courtesy Draper Corporation, Hopedale, Mass.

The cool comfort and ventilation of 24 mesh screen. The clear visibility of quality acetate. American Optical combines them in the Kool-Vent — latest and greatest development in face shields. Unit is mesh except for the area immediately before the eyes. It is recommended for hot operations or any operation where a man wants the best combination he can get of vision and ventilation. Back headband is fiber, adjustable. It fits snugly, comfortably. The long band slides within a fiber sleeve — permits easy nut adjustment for head size. See your nearest AO Safety Products Representative for this "first" in facial protection.

NOTE: The 11" gloves (AO 511SA) have a heavy wool lining throughout. The Silvabestos material has unusual abrasion resistance (up to 168% more) and 40% heat reflection.

Always insist on AO Trademarked Safety Products

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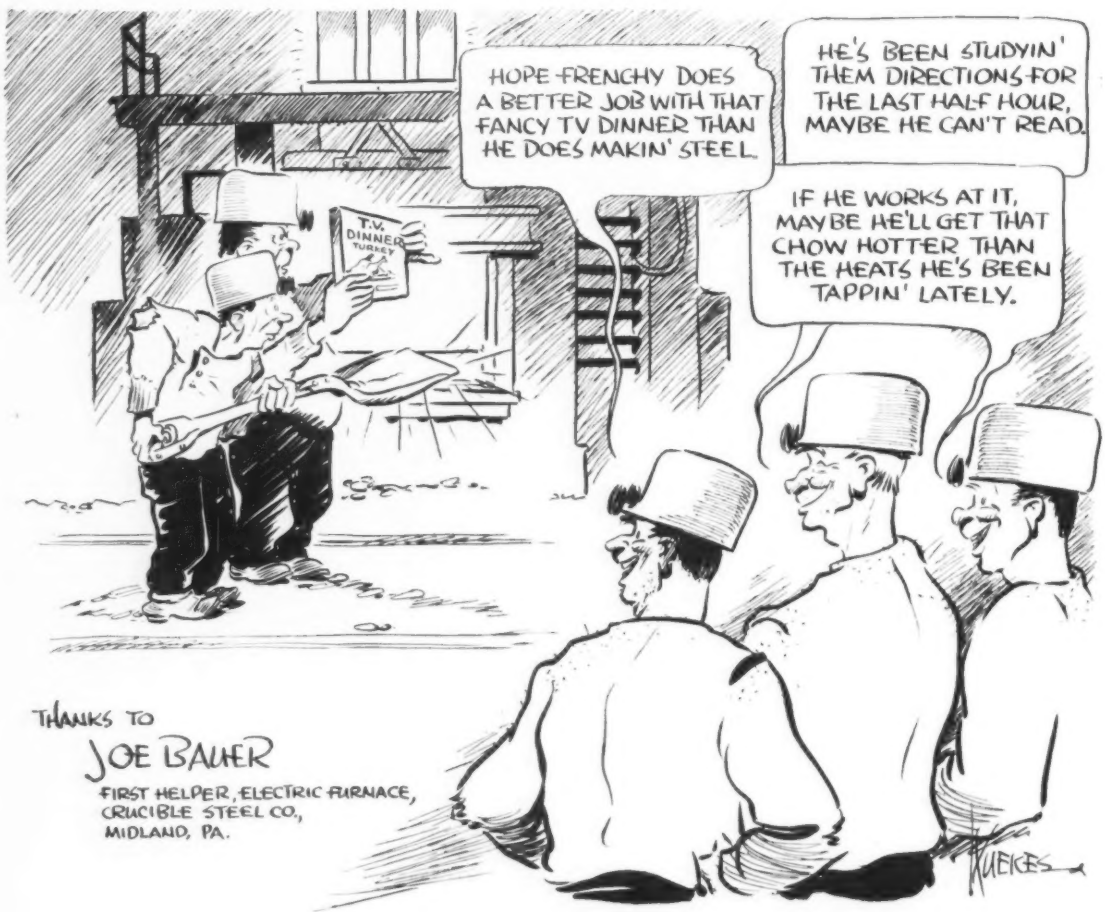
This is because Crucible precision-rolls stainless to produce finishes of incomparable lustre. Not only that, Crucible methodically checks each heat to ensure uniform physical properties and accurately controls gauge with electronic measuring devices. For stainless in all gauges down to .010" and in all strip widths, call or write: Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

CRUCIBLE STEEL COMPANY OF AMERICA

CANADIAN DISTRIBUTOR — RAILWAY AND POWER ENGINEERING CORP., LTD.


HOPE FRENCHY DOES A BETTER JOB WITH THAT FANCY TV DINNER THAN HE DOES MAKIN' STEEL.
HE'S BEEN STUDYIN' THEM DIRECTIONS FOR THE LAST HALF HOUR, MAYBE HE CAN'T READ.
IF HE WORKS AT IT, MAYBE HE'LL GET THAT CHOW HOTTER THAN THE HEATS HE'S BEEN TAPPIN' LATELY.
T.V. DINNER TURKEY
THANKS TO
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FIRST HELPER, ELECTRIC FURNACE, CRUCIBLE STEEL CO., MIDLAND, PA.

The Hot Lunch

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

Magnefer and Syndolag Set Fast—Stay Fast

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RECORD STEEL PRODUCTION IN 1960 is likely, unless railroad or other labor problems intervene. Production is likely to run from 127 to 130 million tons. This would be 8.5 to 10 pct better than the previous record set in 1955. Rebuilding inventory and making up other strike losses will provide the extra demand that will result in the record production.

CONSUMERS ARE STILL IN A BUYING MOOD, in spite of the steel strike and other adverse factors. The University of Michigan Survey Research Center reports: "The combination of rising incomes and consumer optimism prior to the steel strike offers a basis for further expansion of consumer demand . . . The steel strike will not interfere with the rise in spending in the long run or reverse it."

MACHINE TOOL ORDERS HIT THE HIGHEST level this year in October. But the big increase is found in forming tools. Based on a big splurge of orders for presses, orders for forming tools in October more than doubled the September rate. Net orders for forming tools hit $23.5 million in the month. Orders for cutting tools dropped slightly, however, to $43.65 million.

RESEARCH SPENDING IS INCREASING as industry tries to develop new materials for markets in the next three to seven years. Right now, emphasis is on materials research. Later, it will shift to fabricating and development. New methods and materials are already showing up from research done in the early 1950's.

ATOMIC POWER IS ABOUT READY TO COMPETE with conventional generation in some places. That's what Gwilym A. Price, chairman of the board of Westinghouse Electric says. He says it's now possible to guarantee the costs of new atomic plants, and that these costs will permit commercial operation at some sites.

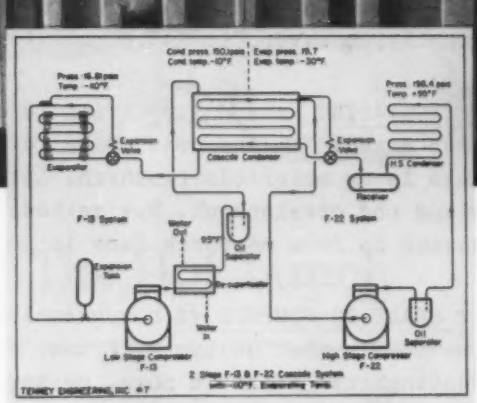
PACKAGING MACHINERY SALES IN 1960 are predicted to be 27.37 pct over this year. And 1959 sales should be 24.67 pct over last year's. Largest buyers next year in this rapidly expanding industry are expected to be, in order, pharmaceuticals, frozen foods, and cosmetics.

MAKERS OF INDUSTRIAL HANDLING equipment also foresee better sales in 1960. But they do not anticipate a business boom, although they are optimistic. Material Handling Institute members indicate sales will run 15 to 25 pct better in 1960.

Copper Alloy Bulletin

BRIDGEPORT BRASS COMPANY

Bridgeport Brass Co.



Bridgeport Copper Tube Used for Refrigeration System

Called "Old High and Mighty" by its designer and builder, Tenney Engineering, Inc. of Union, N. J., this $500,000 chamber will simulate supersonic flight conditions for McDonnell Aircraft Corp., St. Louis.

The complete unit weighs 125 tons and has a temperature range from -100° to 1200°F with an altitude range from sea level to 125,000 to 150,000 ft.

Providing the great degree of cold for the chamber is the Tenney-patented Cascade Condenser System, a custom-fabricated refrigeration and vacuum system. It is exceptional in that it uses two coolants—Freon 13 and Freon 22—the latter coolant condenses the Freon 13 below the freezing point.

Naturally, the system must be both absolutely leakproof and corrosion resistant and the materials used must be easily workable and readily available. To meet these requirements, the designers chose Bridgeport Type M, 5/8" to 1 5/8" copper tube for the refrigeration system's vacuum pump interconnections, and Bridgeport Type L copper tube for the refrigeration lines.

Your needs may not be as exceptional as those cited here, but you can't do better than buy Bridgeport. Your nearby Bridgeport Sales Office has information on all of Bridgeport's metals from Aluminum to Zirconium. Call today, or write Dept. 3412 for complete list of products. Bridgeport Brass Company, Bridgeport 2, Connecticut.

Pent-Up Steel Demand Will Bring Record Steel Output in 1960

Production of steel could be as much as 10 pct over the previous record set in 1955.

Losses of steel sustained in the strike will provide the bulge in pushing production to record heights.—By Tom Campbell.

▪ More than 127 million tons of steel ingots will be made in 1960. And there is much more than an even chance that the total will be closer to 130 million tons.

But when the factors behind this prediction are analyzed, steel demand doesn't look as good as the figure suggests. Here are two main reasons behind this optimistic forecast.

The loss of almost all steel inventories this year during the strike is the main force behind the drive to keep mills at top speed during all of next year. The second factor is the actual loss of steel which meant lost production to manufacturers. This, they will be out to recover as soon as possible.

Up From 110 Millions—So instead of the 110 to 115 million tons of steel that would have been produced to fill a normal market in 1960, the rebuilding of inventories and recovery of lost production will result in the new record production.

The new record estimated at 127 to 130 million tons of ingots will be about 8.5 to 10 pct higher than the previous record of 117 million tons set in 1955.

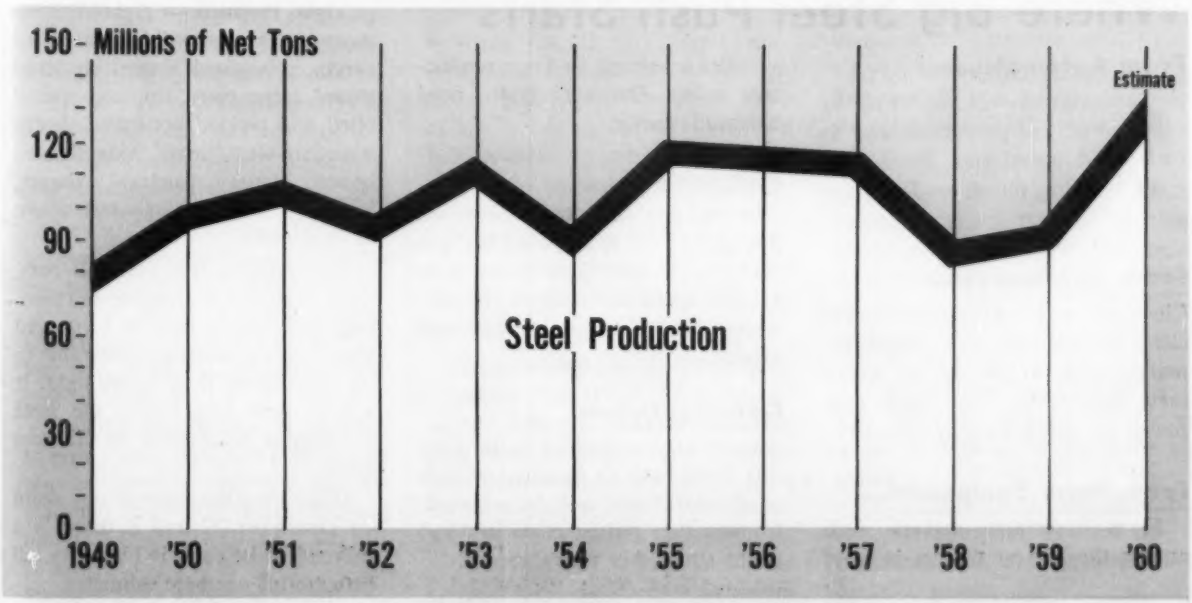
No First Half Buildup—It is very doubtful if steel users will be able to add to stocks much before the third quarter of next year. There may be some who will be able to build up scanty supplies that will enable top production schedules. But the number will be small in the first and second quarter.

Automakers have been hit the hardest. They will have to refill their pipelines, make more cars to fill the deficiencies, and assemble still more to make 1960 their best year since 1955.

Seven Million Cars?—There is no reason to suspect that auto companies in the U. S. won't make close to seven million cars next calendar year. The minimum will be 6.8 million.

In order to do this, the automakers have a big job ahead. In other years when steel was short, it sel-

Steel Bounces Back to New Production Record



dom reached the point of shutting down auto plants. Or, if some were shut down, the pipelines were not cleaned out as they are now.

Pipelines to Fill—Not only the auto producers, but their parts makers, stampers and other suppliers will be on their steel sources' necks for months on end. The automakers have put large tonnages of ingots and semi-finished steel into the mills' pipelines in conversion deals, but even that won't alleviate the tightness in steel products. All it can do is bridge the gap before the heavy shipments of regular steel roll again.

The automakers, appliance makers, farm equipment builders, railroads, and construction are in the van in demanding all the steel they can get. (See box.) But others aren't far behind.

Warehouse Picture—Steel warehouses have done a great job taking care of the big and little users on a less-than-carload basis. Many plants were able to get by because of excellent warehouse service.

Now that these steel service centers have expended all their stocks, it would seem logical that they will get good treatment from the mills to refill some of the bad holes in their greatly unbalanced supplies. But this may not happen so soon. Warehouses may be far back in the line before they get anyway near what they want—and what they can sell.

Tinplate Needed—Just when all of the other major consumers are screaming for steel, in will come the canmakers. They will claim they have been patient because they hoped to get their fair allotment of tinplate and terne plate.

As far as possible, they will. But it may take some time and some critical periods before canmakers have the supplies they need. They face heavy demand and will attempt to get back what they lost to substitutes (bottles) during the strike.

Capital Outlook—The great unknown that will probably turn up to support an all-time record steel output next year is in new plants and equipment. While there were some projects that were postponed late this year, it is expected that all will be reinstated next year. Steel mills will do much repair, replacement and modernization. The strike shutdown probably showed where a lot of changes are needed. The outlook for steel industry capital expenditures is rosy, and, while not generally realized, steel companies consume great quantities of steel in their own rebuilding programs.

But probably the greatest zip in the market will come from all buyers trying to build up stocks. Even if the steel contract is a three-year pact, all users are far below the danger line in inventories. Because everyone and his brother will try to rebuild at once, it can be expected that distribution problems will be complex. The idea that allotments and fair treatment should satisfy most users only comes from not knowing the industry and its customers.

Influence Parade—The parade of "big wheels" to steel plants started a few weeks ago and will go on for months to come. As usual, the auto men lead the parade. Next come the heads of middle-sized plants and later will come the smaller plant people who will claim they are getting the short end of the stick.

But mills are ready to show proof that they are trying to do a better job than ever before, in spite of expected user claims that they are not getting fair treatment.

The fast pickup at the mills showed that steelworkers in the mills are the same as in the days of old. Talk of better bricks and good planning is true. But it is also true that the steelworker wants to do, and does, a good job without rancor affecting his day's work.

Tight Products — Tightest items most of next year will be cold-rolled sheets, galvanized sheets, electrical sheets, terne plate, tinplate, special oiled and pickled hot-rolled sheets, some stainless items, wide flanged beams, large structural shapes, heavy plate and bars—just about in that order.

Easiest items will be small bars, small shapes, wire, fencing and pipe. But "easy" is a relative term and applies to a condition comparable to the other items that will be tight. It will be next July before the steel situation is satisfactory to all steel users.

If the longshoremen go out again on December 27 and if there is a railroad strike early in February, all bets are off on these estimates.

Where Big Steel Push Starts

From Automotive—

Big automakers will be trying to catch up on lost production and to rebuild inventories. Production goals will be aimed at 7 million cars.

From Appliances—

Christmas sales of appliances will clean out most dealers. Appliance makers will go all out to widen their lines which have been narrowed by strike-induced cutbacks.

From Farm Equipment—

Farm implement makers were among the biggest traders in steel supplies in efforts to keep production going. But they badly need balanced stocks.

Railroads—

Car building and repair suffered during the steel strike. Not only was steel scarce, but many roads were hard-hit financially, had to cut programs. Now they are rolling, and earning.

Construction—

Awards have started up again. Jobs that were held up because of lack of structural steel will be resumed. Construction put in place in 1960 could equal this year's record.

Crucible to Install Degassing Unit

▪ Crucible Steel Co. will install a Dortmund Horder Huttenunion degassing unit at its Midland, Pa., plant early next year.

This will be the first installation of the DHH process in the U. S. And it will be the first attempt in the U. S. to degas general steels. Now several firms are degassing their forgings by another method.

Where to Use It—The process, devised by Germany's biggest steelmaker after six years of development work, will degas steel made in electric and openhearth furnaces, and oxygen converters.

To date, about 80,000 tons of steel has been degassed in Europe by this technique. The results: Generally more than half the oxide inclusions were removed, hydrogen flaking eliminated, and nitrogen significantly reduced. Users report the reduced gas content and improved cleanliness has increased the product yield, and improved hardenability response, drawing characteristics, machinability, and mechanical properties.

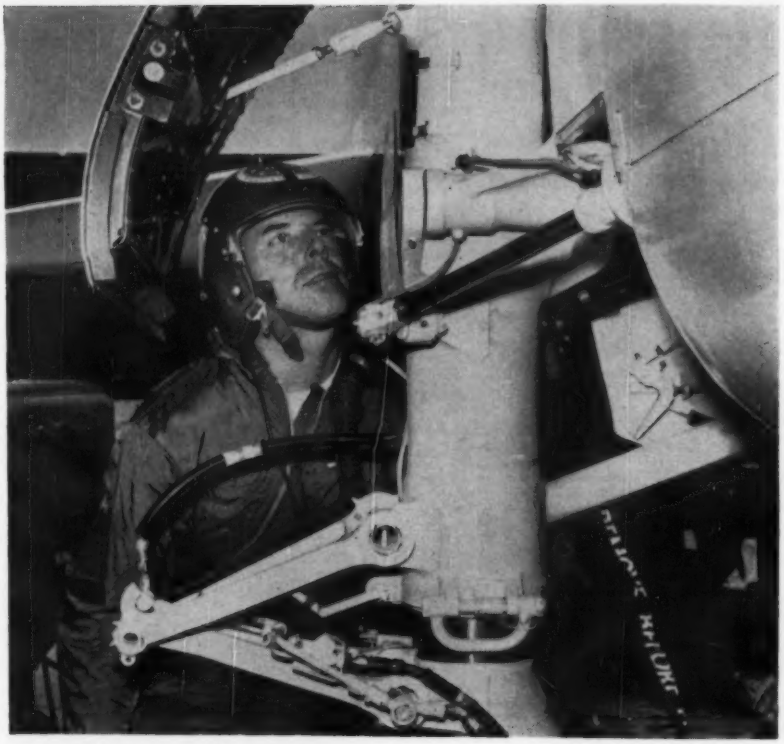
How Big—The Crucible unit will be able to handle heats to 200 tons with an annual capacity close to one million tons.

In the DHH degassing method, liquid steel is forced into an evacuated vessel by atmospheric pressure. After degassing, the steel leaves the vessel with enough kinetic energy to produce complete mixing.

Alloying additions are made from bins mounted on the top.

Prevents Heat Loss—The vessel is preheated to the temperature of the molten steel with graphite resistance rods mounted inside the vessel. This prevents much of the heat loss that might be expected in this type of setup.

Crucible reports that in addition to right to have the unit built, it will also get complete technical and operational know-how in the transaction with DHH. The installation will be designed and built by Lectromelt Furnace Div., McGraw Edison Co.



STRONGER: Jet pilot H. Powders, Lt. Cmdr., USNR, inspects the landing gear on the "Vigilante," made of the new U. S. Steel alloy, Strux.

New Alloy Shown At "Operation Top-Gun"

▪ When the U. S. Navy's new, supersonic airplane, the A3J "Vigilante" slams onto the flight deck of an aircraft carrier and jolts to a halt in arresting cables, its landing gear has absorbed at least 100,000 lb of impact shock—even on a perfect landing.

U. S. Steel may have the answer to this, and other such space age problems.

Yuma Debut — At "Operation Top-Gun," the Navy's fourth annual aerial weapons meet, held this year at Yuma, Ariz., the Corporation introduced a new alloy—USS Strux — which will be tested initially on Vigilante landing gear.

Strux, says U. S. Steel, has about seven pct greater strength to weight than other constructional steel alloys. And they report it can be forged, then heat treated to tensile strengths of 280,000 to 300,000 lb per sq in.

Testing One Two — Bendix Products Div., Bendix Aviation Corp., makers of the landing gear, have already approved Strux mechanical properties and fabricability. Now they are ready to actually test Strux-made gears.

Next on the agenda will be to seek out other aircraft applications where strength to weight is the key factor.

U. S. Steel will sell Strux hot rolled or annealed, in a full line of bar sizes, and blooms and billets to 15¾ in. sq.

Research Race Picks Up Speed

More and more dollars are being plowed back into research and development.

The emphasis is on materials research. Later, it will shift to fabricating and development work.—By K. W. Bennett.

▪ The research race is on. Many companies already plow up to six cents of every sales dollar into research. Next year the percentage will increase.

The main target: New materials aimed at markets three to seven years away.

Battelle Memorial Institute's metallurgy department manager, J. H. Jackson, sums it up this way: "We've seen the rise in interest in materials research over the past year. It's now at fever pitch."

Shift Expected — Research men plot the outlook as a rising tide of materials research for another year. Then emphasis will shift to fabricating and development. And, a few years from now, a broad range of new products, built from new materials, will be rolling onto plant loading platforms for delivery to the customer. A researcher comments, "If you're in business, it's like having your competitor light the fuse of a bomb that could explode years later."

The gains in research spending are easily spotted. Fairbanks-Morse and Co., while dedicating a new research center, announces it will build another laboratory next year. Then the company adds its research budget will increase from $1.5 million this year to $2.5 in 1960.

Busy Researchers—Battelle, biggest of the independent research foundations, will top $23 million in 1959, up from $21.7 million last year. Armour Research Foundation will do a record $15 million. And Dr. C. N. Kimball, Midwest Research Institute, reports it will do $3 million in research this year, a 25 pct annual gain.

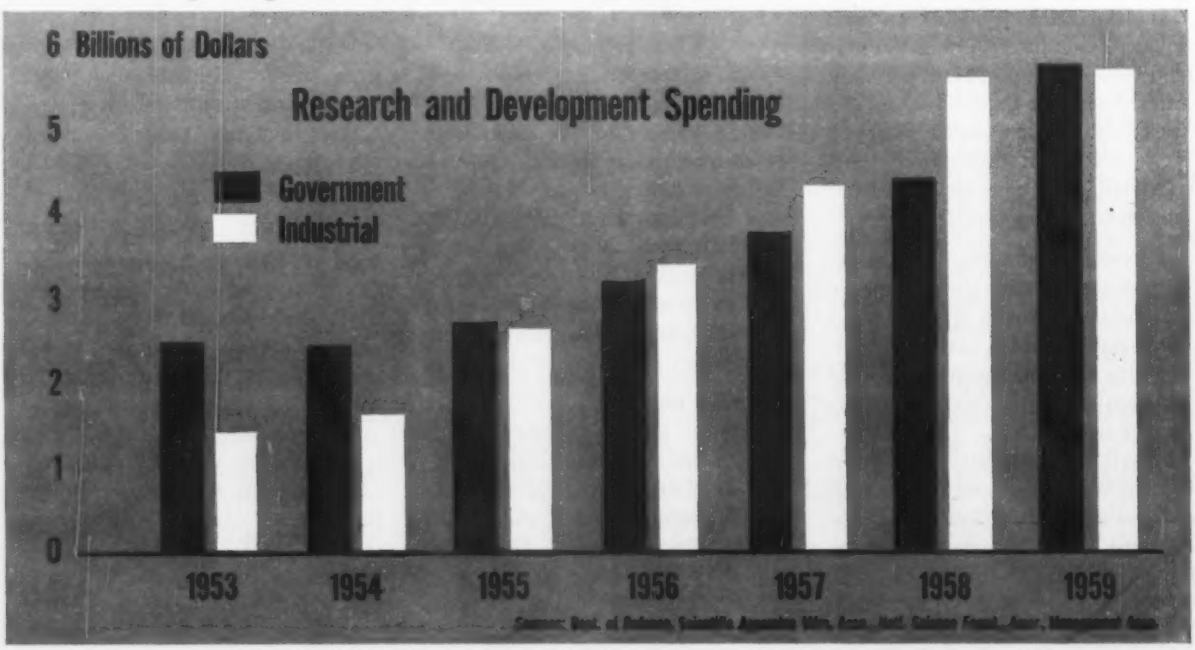
Research Results — A surge of new fabricating methods and materials are already moving out of the lab. They're the products of the research hunt that began in 1950-1951.

Ford's Ausforming, rolling in a limited temperature range, is already credited with producing high strength ductile steels rated at 400,000 psi. Still in the laboratories of one research group is a cold-wall copper retort induction furnace that will melt metals in either atmosphere or vacuum at 3600°F. Some believe the furnace has heating potentials that leave research men inquiring if the top limit is measurable.

Materials with a 1000 ohm resistance per circular mil foot are already on the way. Two years ago, 30 high temperature lubricants and hydraulic fluids were known, and more were needed. A single lab has synthesized 40 in the interval.

Forging Progress—Forming with dies heated to over 2000°F is

Industry Spends More Dollars on Research



coming after adequate research. Forging a classified ultra-hard metal was possible only with 5-10 lb forging blanks last year. Recently, ingots of several hundred pounds were forged. Titanium alloys with the machining characteristics of stainless are out of the lab.

Ultra low alloy, heat treatable steels, with 100,000-plus tensile strengths, are under study in bar and plate stock. The target is hot forming and air cooling to get heat treat properties without an actual heat treat cycle.

Foundry Research — Foundrymen are active in both material and methods research. Moldable graphite and ethyl silicate for large, high tolerance semi-permanent molds are developing rapidly.

Surprising to many researchers is the resurgence of steel. Comments the head of a metals research department, "In the late '40's we began to get the feeling we knew all about steel. Now we're learning enough to know how wrong we were." Corrosion of stainless is getting study. Fatigue resistance is also drawing heavy interest.

Development of materials is a prime research goal. The hunt is spreading through all phases of metalworking, from steel for electronic chassis, to stainless steels for earthmoving equipment.

More Manpower—Greater use of manpower in research and development is another measure of the surge. In 1957, there were 222,800 scientists and engineers in research. A conservative estimate of the 1959 R&D manpower pool totals 290,000. These researchers have accumulated a four year backlog of patent search applications at the U. S. patent office. The number granted rose from the low 36,664 of 1954 to 51,072 in 1958.

GE's System—General Electric illustrates the trend to greater research. Of 22,000 engineers and scientists on the company payroll, 9000 do research and development work in three laboratories and the operating divisions. There's a pure research lab, backed by an engineering lab and a manufacturing lab. In addition, R&D men, the bulk of them, are assigned to the operating divisions.

MATERIALS RESEARCH: Study on gas adsorption techniques at chemistry laboratory of Boeing Airplane Co., Wichita, Kansas, is typical of increasing emphasis on industrial research and development.

Generally in large companies one lab works out new ideas. Other researchers solve problems that arise in existing product lines or manufacturing methods. It's the answer to the plea of most research men that companies still call them in to solve problems manufacturing or marketing divisions can't lick. These researchers are tied to improving existing ideas, not creating new ideas.

The Big Hunt—Toughest job in tackling a research problem is locating past research on it. With 50,000 technical publications printed in the world each year, it's impossible to know whether you're duplicating an experiment already performed elsewhere.

General Electric developed the Information Searching Selector for the job. It will riffle through 100,000 abstracts an hour, deciding on eight levels of logic if the information would aid your problem. The service isn't yet available, but the American Society for Metals and Western Reserve University will bring similar units into action next year. They'll review 12,000 publications annually. Researchers will get the service at a reported $300 a year.

Again the Russians—How good is the end result? Not good enough —yet—in the opinion of some research men themselves.

Says one, "We've got to do a better job on literature search. The Russians do it. I shouldn't say this, I suppose, but Russian research has the world's best system for cataloguing research results."

White Collars Lead Job Outlook

Manufacturing Fails to Add Its Share of New Workers

Manufacturing industries have been expected to absorb the largest number of new workers in the decade ending in 1965.

But the number of production workers has changed little, while white collar fields absorb the growing labor force.—By G. J. McManus.

▪ New workers are pouring into the labor force at a rate that points to an economic explosion, an economic bust or a drastic reshaping of job patterns.

About 1 million workers a year are being added to the labor pool. The 10 years ending in 1965 will see 10 million more job seekers to be employed or unemployed.

On the surface, new workers seem to be flowing smoothly into the economy. In the past 12 months, 900,000 new faces have appeared in the labor force. During the same period, unemployment has declined from 4.8 million to 3.3 million.

Government Growing — Long term figures look equally reassuring. Since 1956, the labor force has increased by 2.4 million. Employment in this period has risen by nearly 2 million. Considering the steel strike and last year's recession, the unemployment rise indicated by these figures does not seem alarming.

However, a closer look at job totals shows two disturbing points: First, a large part of the employment gain since 1956 is due to a 1.1 million jump in government jobs. Secondly, there has been no gain in manufacturing employment in recent years.

Early projections by the Labor Dept. called for government payrolls to expand about 16 pct in the period from 1955 to 1965. However, government employment has already just about reached the 8.3 million predicted for 1965.

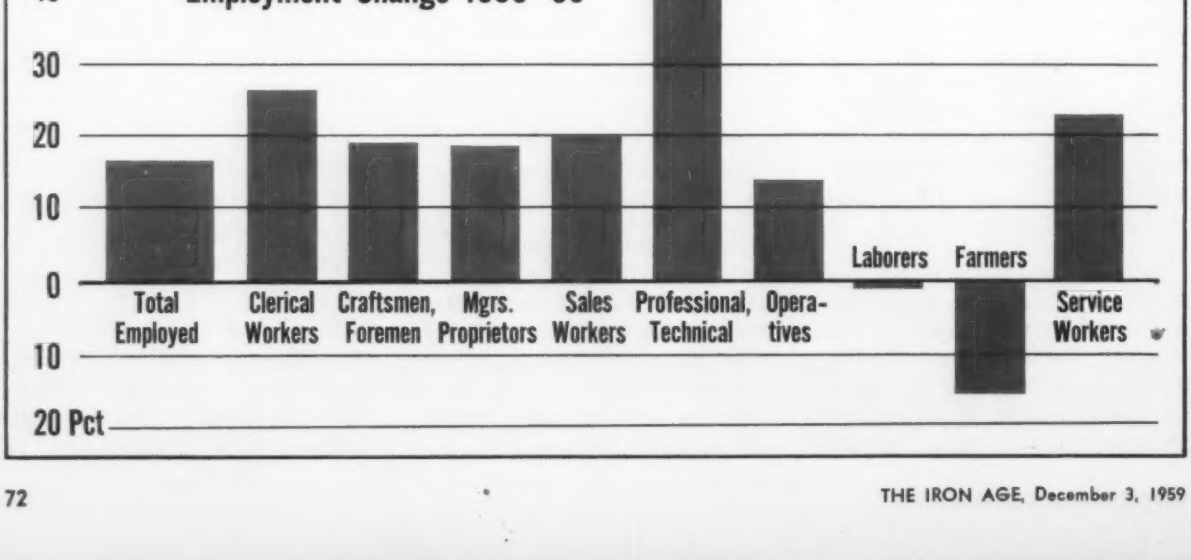
Industry Lag — Estimates of manufacturing employment trail the earlier projection. It was expected industry would take on 3 million more workers between 1955 and 1965. Manufacturing jobs were due to hit 20 million by 1965.

Downward revision of this target was indicated recently by Ewan Clague, head of the Bureau of Labor Statistics. While not giving up yet on the early prediction, Mr. Clague points out that plant employment is running well behind schedule.

Extent of the lag is shown by October figures. Plant employment for the month was 16.1 million. Even allowing for 500,000 idle steel workers at the time and another 300,000 laid off because of steel shortages, the figure still represents little or no gain from 1956.

Metalworking to Gain?—Actually, plant employment has held around 15 or 16 million for the past 10 years, despite a 40 pct hike in plant output. And during the 20 years before World War II, it held at 8 to 10 million. The

Laborers' Share of Jobs Declines



one big lift of the past 40 years came during the war, when the plant base rose about 4 million.

This background indicates it will take an expansion of wartime proportions for industry to absorb its share of the new work force.

Is the nation heading for this kind of growth period? In making his projections, Mr. Clague uses a population estimate of 190 million for 1965 and a gross nation product of at least $560 billion.

Mr. Clague's projections for the 1955-65 period show job expected employment increases of 25 pct for transportation equipment; 33 pct for electrical machinery; 20 to 25 pct for machinery and fabricated parts.

White Collar Workers — Steel shortages distort current figures but among these leaders, only electrical machinery is running ahead of 1956 job levels. The decisive gains seem to be coming in government, service (up 400,000) and trade (up 300,000).

But the biggest single group of new workers was supposed to go into manufacturing. At the halfway mark in the ten-year period, none of the expanding workforce has been absorbed by industry.

These facts point strongly to pressure for more government jobs and to a continued swing of the labor force away from manufacturing. In 1956, the number of nonproduction workers exceeded the number of production workers in this country for the first time.

Time of Change—Now another 10 million workers are coming on the scene and most are again going outside manufacturing. From an employment standpoint, we are changing overnight from an industrial nation to a service nation.

Regardless of how jobs are distributed by industry, the outlook is for the trend toward white collar work to continue. Projections call for the 1965 decade to see a 25 pct increase in clerical workers; a 43 pct increase in professional and technical workers; and about a 20 pct increase in managers.

Stainless Gets Push At Retail Level

Producers of stainless steel hope to boost their sales to manufacturers by promoting retail sales.

And suppliers of nickel and chromium, looking for greater sales to stainless producers, have joined the campaign.

■ Leading department stores across the country are setting up special stainless steel "shops" to promote the sale of stainless housewares. And there are appropriate tie-ins with other departments in the stores carrying stainless goods.

Normally, promotions of this type would hardly be worthy of note. But department stores have seldom been noted for vigorous promotion of stainless steel consumer goods.

Why the sudden change? The stores are getting assistance from stainless steel producers, another group without a long history of promoting its products at the retail levels.

To Add More Stores—The producers, through the American Iron and Steel Institute's Committee of Stainless Steel Producers, provide sales training assistance, point-of-purchase material, and coordinated publicity. In the works for 1960 is a training film for retail salespeople to supplement present aids.

So far, a half-dozen stores have established sales centers for stainless housewares. The producers committee hopes to see another 30 started in 1960.

Initial success of the promotion venture indicates that retailers will welcome more marketing assistance from the stainless steel producers.

Successful Selling — New York City's R. H. Macy & Co., the largest department store in the U. S., a few months ago opened a department featuring stainless steel flatware and holloware. Since then, flatware sales have tripled and holloware sales have quadrupled over the same year ago period.

Promotional push is also coming from individual companies, particularly those supplying the ingredients that make steel stainless. International Nickel Co. and Union Carbide Corp. figure to increase sales of nickel and chromium to stainless steel producers by boosting the demand for stainless at the retail level.

Inco promises its 1960 promotion campaign will be at least twice as big as the campaign it tried for the first time last winter. Already some 61 leading department stores, with a total of 154 big-city main stores and suburban branches, have agreed to participate in the campaign.

Buyer's Guide—Union Carbide distributes free through department stores a buyer's guide to stainless steel consumer products. The guide lists manufacturers of stainless steel consumer goods by product — under the general headings of automotive, hardware, home building, home furnishings, personal and recreation.

Underlying these and similar campaigns is the recognition that retail customers are the end consumers. The sale of nickel and chromium to stainless steel producers, and the sale of stainless steel to product manufacturers, really depends a great deal on selling stainless steel products at retail.

Material-consciousness has already helped boost sales of stainless steel consumer products to an estimated volume of $400 million in 1959.

TIME MACHINE: Westinghouse Electric Corp. uses modern computers to help power companies plan needs.

To Plan Your Company's Future: Live 20 Years in 20 Minutes

Running a mathematical model of company operations through a computer can put guesswork of future needs on a scientific basis.

Called operational gaming, it provides management with an opportunity to compare alternate plans.—By G. J. McManus.

▪ If you could relive the past 20 years, what changes would you make?

New planning techniques offer industry a choice very much like this. They enable companies to view the future as though it were past. They enable management to second-guess its own decisions.

Electrical and aluminum suppliers are among those now living out in advance the next 20 years of their corporate lives. The companies involved pass through not one but many futures. With the benefit of hindsight, they then choose the one they like best.

Decades in Minutes — The method used for this experience is known as operational gaming or system simulation. It takes a mathematical model of company operations and predicts the future on a day-by-day basis. Key decisions are logged enroute. Economic results are totaled at the end of the period covered.

All this happens at electronic speed.

"In 20 minutes, a high speed digital computer can reproduce 20 years experience on a mathematical model," says Joseph K. Dillard, manager of electric utility engineering, Westinghouse Electric Corp.

Powercast Service — Westinghouse employs the gaming technique in its Powercast service, now being offered utility customers. This particular method came out of a study begun 18 months ago by Westinghouse and Public Service & Gas Co., New Jersey.

The study sought answers to the question: What schedule of equipment installation will meet future needs with the least cost? Working with long lead times, the utility wanted to time projects so that new capacity would be available in time to meet growing demands. At the same time, it did not want to waste capital by moving too soon.

Shows What Happens—To represent and project the tangle of a utility system, the joint study group turned to the simulation method. This approach does not require a full mathematical description of system relations. It merely shows what happens.

"It's like a toy train system with converging tracks and cars," explains a Westinghouse engineer. "It might not be practical to set up formulas that would cover operation of the system over a period of time. But you can very simply see what happens by turning on the switch and tracing activity."

Along these lines, the Westinghouse program simulates operation of a utility over a 20 year period. For each day covered, the computer records the load on the system, the capacity of the system and the margin of reserve power. For each month it comes up with a figure that indicates the chance of load loss due to insufficient capacity.

Figures Cost — When the probability of loss reaches a critical point, the computer adds another generator. Date of the addition is noted. The simulation continues through the 20 year period with generators being added whenever the chance of load loss gets too great.

During the simulation, the computer is also figuring production costs. Once it has come up with a schedule of generator additions, the machine goes back and figures capital costs for both generation and transmission. Finally, the machine comes up with a total dollar cost for the plan it has devised.

In figuring daily load, the computer works from a trend line showing rate of growth. This basic figure is modified by things like booms, recessions, hot weather and cold weather.

Chance Variables Considered—Basic capacity figures are also altered from day to day. Planned maintenance, forced outages, management mistakes are all considered in setting the actual capacity available on a given day.

Some of these variations are controlled and can be built into the program logic on a predictable basis. Maintenance work, for example, is controlled by management policies. Other elements follow past patterns fairly regularly. Economic booms and recessions are scheduled according to historical cycles.

But chance variables must also be considered. When will a machine break down? When will supervisors underestimate the amount of capacity that must be started up for the next day? In these areas, Westinghouse gets into what it calls "predicting the almost unpredictable."

Monte Carlo—Effects of these random events are calculated by a form of probability statistics (Monte Carlo). From a study of past records, statisticians come up with a pattern covering machine breakdown. Probabilities are cranked into the computer. Then a given program is run through ten times.

Each pass gives a slightly different schedule of equipment installation. Averaging these results gives statisticians the schedule that will reflect the most probable effect of random variables.

The separation between random and predictable variables is not clearcut. There are gray areas now and analysts suspect that further accumulation of data will show strong patterns for many events that seem now to operate on pure chance.

Works on Water—This view is supported by the experience of an aluminum company recently. The company was using operational gaming as a means of planning future power sources. A big questionmark in its plans was the availability of hydroelectric power. And a big element in the hydroelectric situation was future water supply.

In talking to weather men, the programmers learned that rainfall on a longterm basis is highly predictable if you go back far enough in setting up patterns. By digging back 70 years, the company was able to establish the basis for a precise estimate of its water future.

Unlike other types of operations research, simulation does not come up with a single best solution or plan. It gives the result of one general plan. It makes it easy for management to compare alternate plans.

Lincoln Appointed To Defense Post

Franklin B. Lincoln is President Eisenhower's choice as new top money man in the Defense Dept.

Mr. Lincoln succeeds Wilfred J. McNeil, who left the government to become president of Grace Lines. Mr. McNeil was the original Defense Dept. comptroller and remained for 12 years, under both Democrats and Republicans.

Currently a Wall Street lawyer, Mr. Lincoln also is a director of Barnes Engineering Co., Stamford, Conn., and is counsel to Litton Industries, Inc., Air Products, Inc., Monroe Calculating Machine Co., Inc., Extrex Corp., Hamilton Watch Co., and the Society of Automotive Engineers.

Mr. Lincoln is no stranger to Pentagon money problems. During World War II, he was counsel to Mr. McNeil when the latter was Chief Navy Disbursing Officer and Fiscal Director.

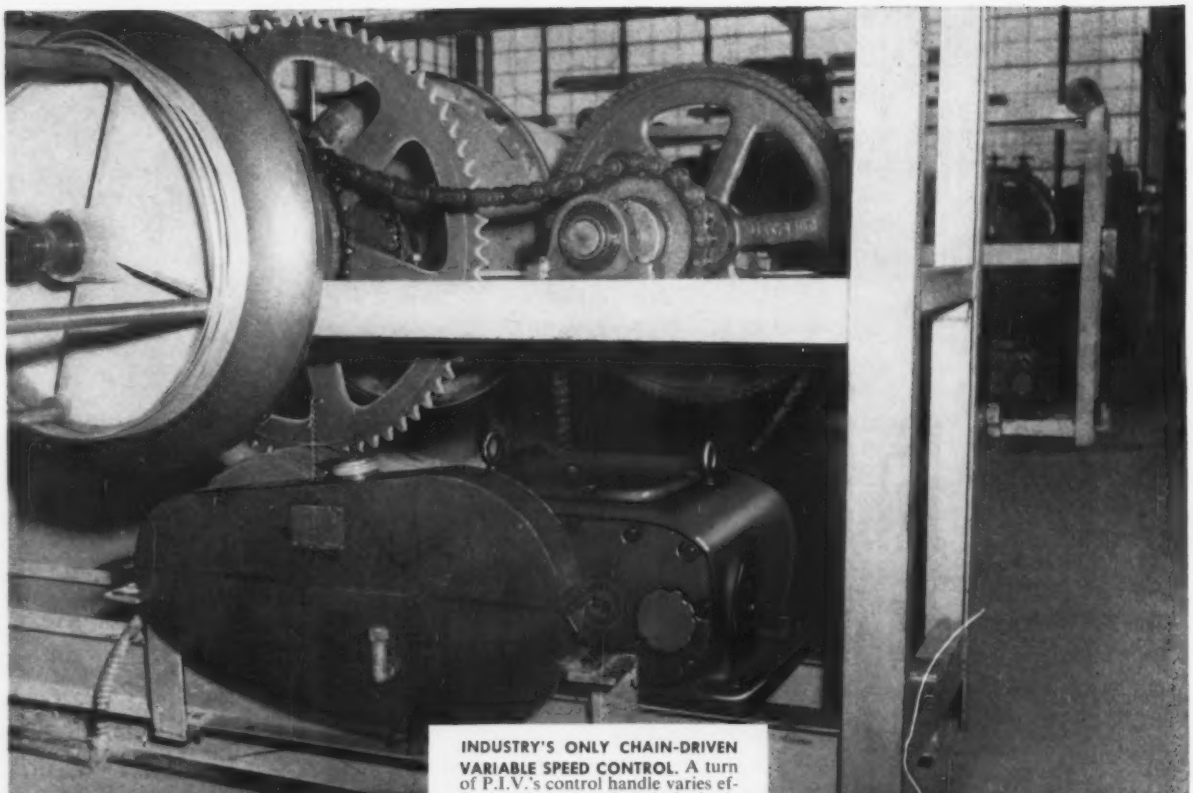
As top financial executive in the Pentagon, Mr. Lincoln takes over as Army, Navy and Air Force Chiefs try to reach final agreement on the $41 billion "austerity" budget President Eisenhower has demanded for the next fiscal year.

Steel Talks Move Back to Capital

Steel labor negotiations are back in Washington, where government mediators are again trying to wedge a break in the long deadlock.

Federal Mediation Director Joseph F. Finnegan called steel union and management officials back to the capital early this week in a fresh effort to find a basis for settling the dispute.

Both Mr. Finnegan and Dr. George W. Taylor, chairman of President Eisenhower's steel fact-finding board, are hoping to push the companies and the union into a settlement before the end of the 80-day Taft-Hartley injunction in late January.



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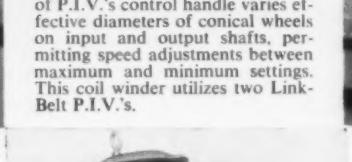

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Keki Bhote

An Outstanding New American

Keki Bhote, assistant director of production of Motorola's Communications Div., is a new American.

A native of India, he studied here. He returned to help his native country; now is in the U. S. to stay.

KEKI BHOTE: One of Chicago's top ten young citizens.

▪ Keki Bhote had his first glimpse of the United States and its industry in 1948 when he began graduate studies at Harvard University.

He had been awarded a year's fellowship for work in applied physics after his graduation from the University of Madras, India, and working for a year and a half in India's only radio factory as a components engineer. He was graduated from the Indian university with a degree in telecommunications and ranked third in the school.

Faster Pace—Mr. Bhote says he found the pace in the American college system was much faster than in India and said studies here are about three times as hard. However, he was able to adapt to American methods and completed his MS degree in one year. His research work was done in the field of power tubes.

When his studies at Harvard were done, he wanted to stay in this country and gather still more information. He contacted the Indian embassy to find him a post in American industry. Shortly afterwards he began working as a lab assistant in Specialities Production Dept. of the Motorola Co. Communications Div.

Good for India—In 1949 microwave was just being developed. Realizing the great impact this would have on his country, Mr. Bhote asked to be moved into development engineering. For two years he worked with every team working on the microwave project. In 1950, when the project was ready for production, he moved it out of the lab and into the factory.

In the same year he returned to India to tell the government there of the new technique that could bring vitally needed communications quicker and cheaper than by wire.

Return Trip—In 1955, he returned to the U. S. and Motorola as microwave chief production engineer. He was recently named assistant to the director of production with the essential responsibility of overseeing quality control.

Mr. Bhote is active in the India Assn., which is dedicated to promoting understanding between the U. S. and India. He also teaches at the Chicago YMCA and is a member of the speaker's bureau of Chicago's Council on Foreign Relations and of the American Assn. of the United Nations.

Top Ten—Because of his valuable contribution to his community, he was recently named one of the 10 outstanding young men in Chicago by the city's Junior Chamber of Commerce.

Mr. Bhote became an American citizen in October.

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Will Consumers Stay Confident?

Buying attitudes will be watched closely when production resumes in full force.

Some believe willingness to buy is still strong, expect new spending records during 1960.

▪ In the months ahead the consumer's attitude will be more important than ever. Whether or not he remains willing to buy is a key factor in continuing the boom.

So far in 1959, the U. S. consumer has spent a little more conservatively than he did during recovery from the 1954 business turndown. But there are signs the buying pace will pick up.

Still Willing—Economists at the University of Michigan Survey Research Center have spent a lot of time studying consumer attitudes. Their latest reports indicate the steel strike has not hurt the buyer's willingness to buy.

Says the Center: "The combination of rising incomes and growing consumer optimism before the strike offers a basis for further expansion of demand, once production is back to normal. . . . If anything, the upward trend in spending will be stretched out by the strike and extended over a longer period of time."

Two facts prove labor troubles this summer and fall have not dulled consumer buying interest, the Center points out. These are the stepped up spending for non-durable goods and services and the "enthusiastic reception" given the 1960 cars.

Rising Income — Consumer spending for cars, refrigerators, and other durables will reach record levels next year, U of M forecasters predict. "Right now consumer income after taxes is about $330 billion annually. Next year consumer income after taxes should be no less than $335 billion (annual rate) in the first three months of 1960. It should approach $350 billion by the final quarter."

"New loans and other types of consumer credit may reach $4.2 billion a month in 1960—$100 million a month more than the current rate. Total consumer credit could exceed the $50 billion mark in 1960."

Debt and Prices — Worries that rising consumer debt will affect consumer spending are "grossly exaggerated." That's what Dr. James Duesenberry, Harvard economist, told the U of M's seventh annual Conference on the Economic Outlook.

So far as consumers are concerned, he says, the total volume of credit by itself is not likely to reduce spending on either durable goods or housing.

Another speaker—Eva L. Mueller, assistant program director of the U of M's Survey Center—discussed consumer attitude on prices. Prices will be a neutral force in buyer's minds in the months ahead, she predicted. They will not encourage spending, as they did in 1954-1955. But neither will resentment against inflation hurt buying, as it did in 1951 and 1957.

Business Looks at Washington

▪ What measures of government policy and spending are businessmen most concerned about?

Some of their prime attention centers around defense, foreign aid, and domestic spending programs, and the bond interest rate.

These subjects were mentioned by 4040 businessmen polled by the U. S. Chamber of Commerce. The opinions were advanced during meetings of chambers of commerce in the East, South and Midwest.

Taxes and Labor—Other interests of businessmen included these:

Tax reform to encourage investment and correct inequities.

Curbs on federal intervention in state and local affairs.

Labor reforms including curbs on union economic power and laws to prevent featherbedding.

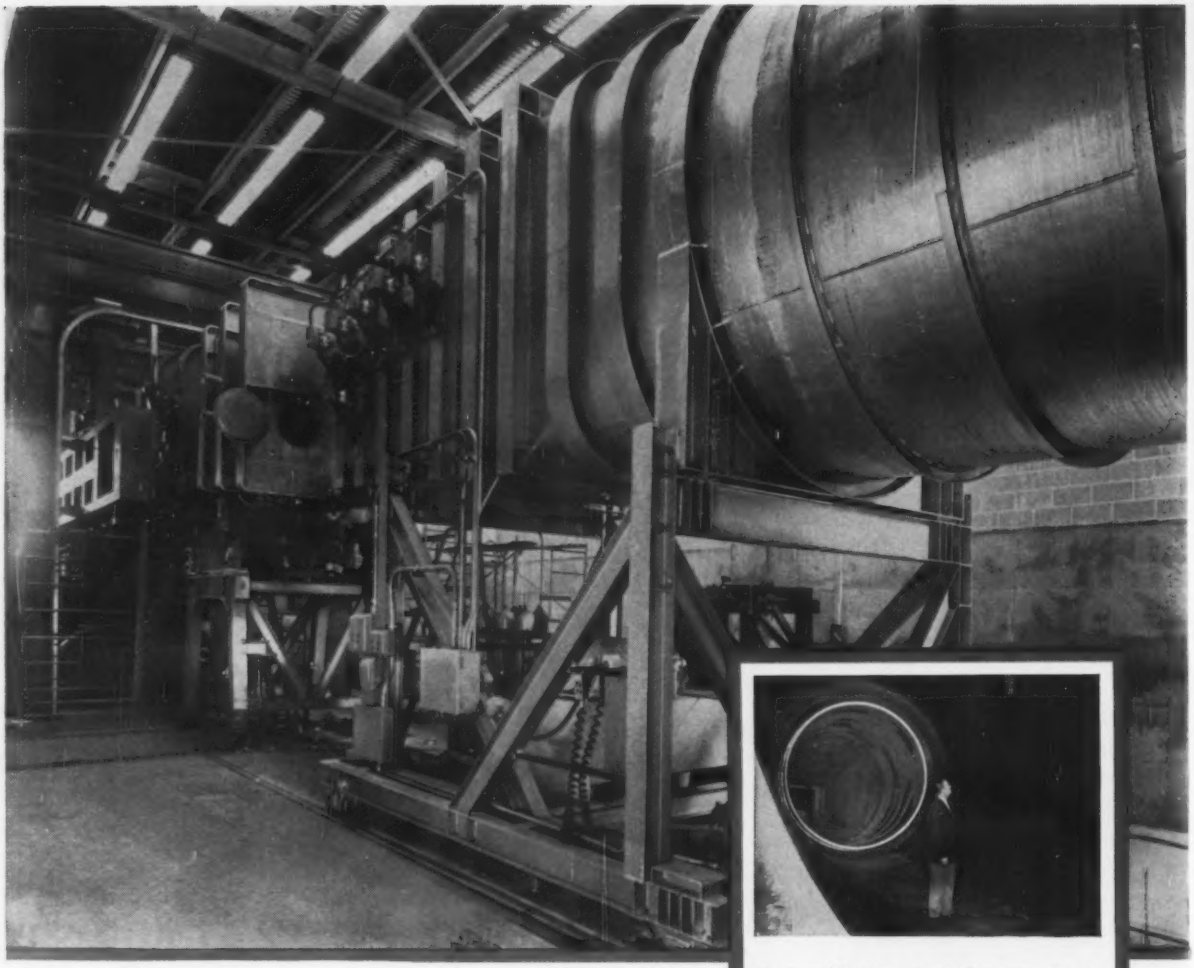
And end to further increases in federal controls on business.

What's Needed—The industrialists feel they, themselves, should learn more about the free enterprise system. After they do, they could help explain the system to others through discussion groups and speeches.

Construction Costs Keep Climbing

Construction costs are still rising. Between March and September this year they increased 2 pct, according to the Dow Building Cost Calculator, an F. W. Dodge Corp. service.

Costs for constructing buildings now average about 2.57 times what they did in 1941, Dodge estimates. The 1941 building dollar has shrunk an average of 3.4¢ a year until 61 of the original 100 cents have faded away.



Scale models of space age airframe components will be tested here in McDonnell Aircraft's new supersonic wind tunnel at St. Louis. Tunnel will simulate the flight conditions tomorrow's aircraft will encounter.

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AN IRON AGE SPECIAL REPORT TO MANAGEMENT

Industry Survey Points Up Need For Depreciation Reform

Next year industry will again make its bid for legislative reform of depreciation laws.

Hearings before the House Ways and Means Committee got underway this week.

This new survey of depreciation practices in metalworking shows why changes are a must.

By **E. C. Beaudet**
Managing Editor

▪ Early this week experts on depreciation testified before the House Ways and Means Committee.

Their purpose: To convince Chairman Wilbur D. Mills and his committee that changes are needed in the way industry is permitted to write off the cost of plants and equipment.

Obstacles to Reform—It's not an easy job. Working against depreciation reform is the fear of a short-term drop in federal revenues; the questionable political wisdom of favoring a change in tax rates which seemingly is only of help to business; the lack of agreement among business leaders on how depreciation laws should be changed.

These obstacles are nothing new. And they still exist. But this year considerations of overall national interest will have an important bearing on the discussions about depreciation reform.

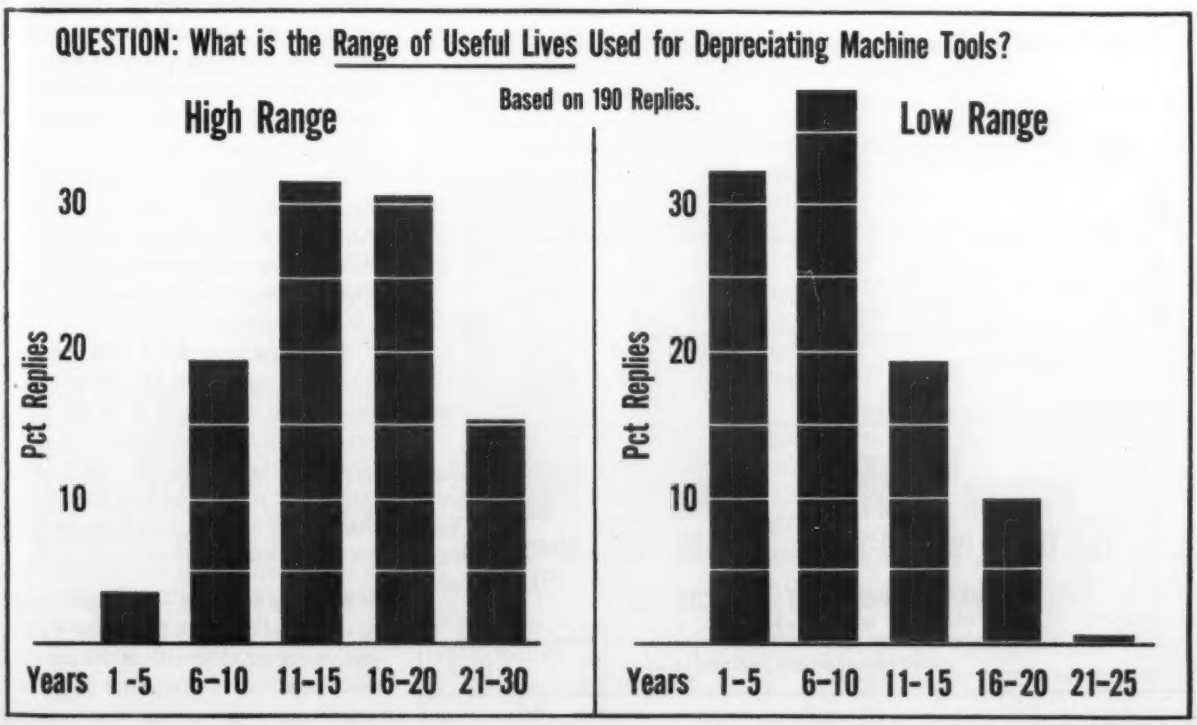
World Competition—Russia's economic offensive has been backed by a tremendous increase in industrial capacity. Western European nations (with many industrial plants new from the ground up) are forcing the U. S. out of many world markets and threatening those at home.

Meanwhile, America has lagged

NEXT WEEK

The Hearings—A full report on the depreciation hearings before the House Ways and Means Committee will appear in next week's issue.

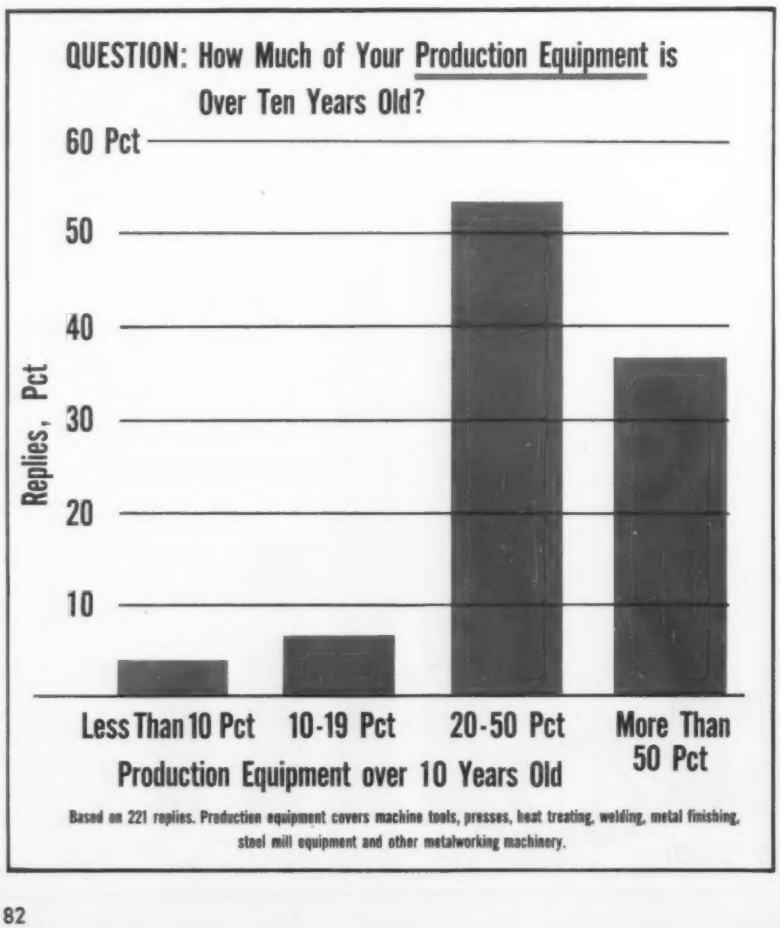
How Users Write Off Machine Tools



What This Survey Covers

Industry Groups	SIC Code	Reporting Companies	Plant Employment Of Reporting Companies
Primary Metals	33	66	168,583
Fabricated Metal Products	34	41	39,029
Machinery (except electrical)	35	87	84,412
Electrical Mach. & Equipment	36	20	14,375
Transportation Equipment	37	14	225,571
Instruments	38	13	7,142
Total		241	536,112

Users Report on Obsolescence



Based on 221 replies. Production equipment covers machine tools, presses, heat treating, welding, metal finishing, steel mill equipment and other metalworking machinery.

far behind in modernizing its production facilities. Inflation has skyrocketed the cost of new plants and production equipment Handicapped by the inadequate depreciation laws, American industry has been slow to revamp its facilities.

Yet, saddled with labor costs far above those in foreign lands, plant modernization looks like the only basis on which American industry can compete for world markets.

New Survey — To throw more light on the problem, The IRON AGE recently conducted a survey of the depreciation methods used by metalworking companies in writing off production equipment.

In this survey, we tried to find out the rates industry actually used, what it would like to use and answers to some of the questions raised in opposition to depreciation reform.

The survey questionnaire was directed to metalworking company presidents, comptrollers and treasurers—men who know the financial side of business and understand the complexities of accounting procedures.

High Obsolescence — Replies came from a broad section of metalworking industries. The 241 companies reporting represent over a half million production workers engaged in the production of metals, metal products, machinery, automobiles and instruments (see table, left).

The survey more than confirmed the high degree of obsolescence in American plants. Of 240 companies, 90 pct reported that over 20 pct of their production equipment is over 10 years old.

The largest part of this group, 53.4 pct, said 20 to 50 pct of their production equipment is in the ten-year-old-and-over category. A distressingly large number, 36.7 pct, stated that more than half their production equipment has been in use for more than ten years.

Few Up to Date—It's significant to note that only 3.6 pct of the companies reported less than 10 pct of their production equipment is more

than ten years old.

Think of these figures in connection with newly equipped plants abroad and you get some idea of the problem the U. S. faces in competing for its share of world markets.

But burdened with long write-off periods, many companies are hard put to replace obsolete machines with more modern and efficient manufacturing tools.

Junk Bulletin F—Bulletin F, the Treasury Dept.'s guide for determining the useful life of equipment for tax purposes meets with almost universal disfavor.

Objections are that it is hopelessly outdated and fails to reflect the impact of technological advances on equipment obsolescence.

Government sources are pretty much agreed with this thinking. A revised version of Bulletin F has been held up since the feeling was that its revision would only do more to confuse the depreciation issue.

The Rates They Use — Meanwhile, until constructive changes are made in the tax laws, the useful lives used for depreciating machine tools and other production equipment will remain quite high.

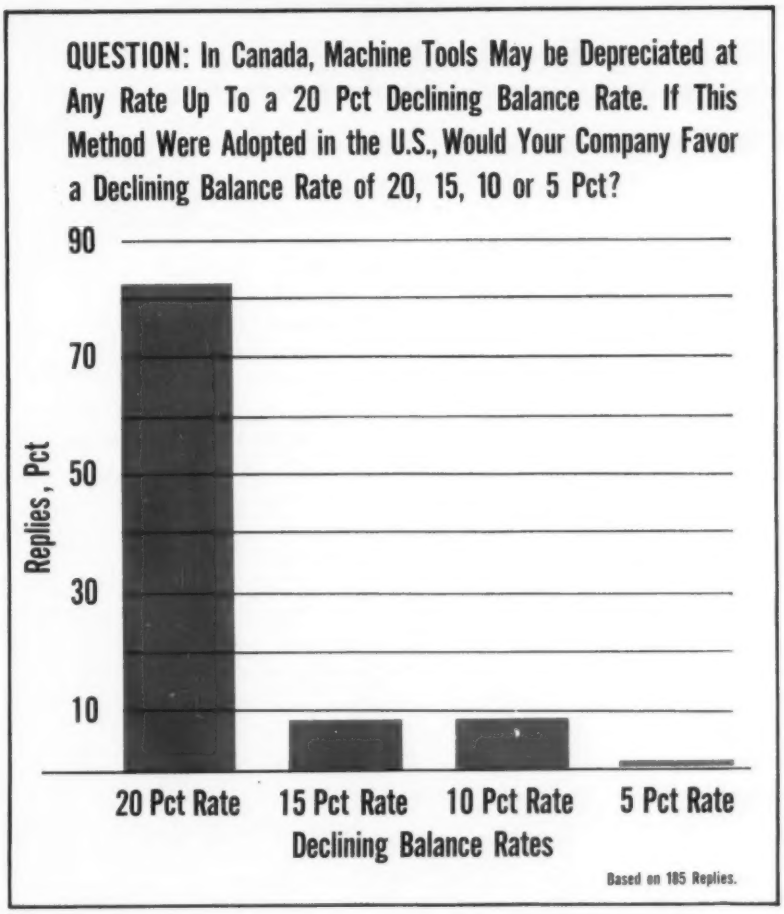
One of the questions asked in The IRON AGE survey concerned the range of useful lives used for depreciating machine tools. Of those answering this question, 62.2 pct said the top limit fell within 11 to 20 years. This group was about evenly divided between those choosing a high range of 11 to 15 years and 16 to 20 years.

Headed for a high degree of equipment obsolescence are 15.2 pct of the companies which reported the high range for depreciating machine tools at 21 to 25 years.

Lag Behind—This is away above the depreciation rates now used in Canada, England, Sweden and other countries abroad. And it's a sure sign of the growing age of the country's industrial plant.

On the low side of the range, an encouraging 70 pct of the companies reported some machine tools were depreciated in ten years or less. Roughly another 30 pct stated that 11 to 20 years was the lowest figure used for depreciating machine tools.

What Rates Users Want


QUESTION: In Canada, Machine Tools May be Depreciated at Any Rate Up To a 20 Pct Declining Balance Rate. If This Method Were Adopted in the U.S., Would Your Company Favor a Declining Balance Rate of 20, 15, 10 or 5 Pct?
90
70
50
30
10
Replies, Pct
20 Pct Rate
15 Pct Rate
10 Pct Rate
5 Pct Rate
Declining Balance Rates
Based on 185 Replies.

What They Want—There's a big difference between the depreciation rates now used by the companies and those they feel they should use to keep their plant equipment up to date.

When asked if they would favor a declining balance rate of 20, 15, 10 or 5 pct, an overwhelming majority of 82 pct chose the 20 pct rate.

The rest of the replies to this question were about evenly split between those favoring the 15 and 10 pct rates. Only a negligible number preferred a 5 pct declining balance rate.

Puzzlers—One of the questions which bothers government is industry's fundamental objective in seeking higher depreciation allowance for tax purposes.

Is business primarily interested in paying less taxes? Or is it really sincere in its desire to modernize its equipment at a faster rate?

Would it keep two sets of books, one showing higher depreciation allowances for tax purposes, the other lower depreciation rates and consequently higher income, for the benfit of its stockholders?

Most Say No—To gain some insight into this area, The IRON AGE asked the companies if they used different sets of books for tax purposes and book purposes.

Of 224 companies answering this question, only 9 pct reported using two different sets of books—and these for very particular reasons. Over 90 pct said the same books

What Companies Had to Say About—

Tax vs. Book Reporting

Question: Does your company use a different set of books for tax purposes and book purposes?

YES— 9.4 Pct
NO—90.6 Pct

Based on 224 replies.

Question: If your company were allowed to speed up depreciation for production equipment taken for tax purposes, would your company use the faster rates for both book and tax purposes (assuming your auditors would accept the faster rate for book purposes?)

YES—87.5 Pct
NO—12.5 Pct

Based on 185 replies.

Question: Is your company concerned about taking higher depreciation rates because of the effect it would have on the company's financial position?

YES—28.1 Pct
NO—71.9 Pct

Based on 210 replies.

Faster Writeoff Privileges

Question: Has your company taken advantage of the higher "first-year depreciation allowance" permitted for new production equipment (up to $10,000 value) since 1958?

YES—46.6 Pct
NO—53.4 Pct

Based on 232 replies.

Question: Is your company now using the double-declining balance and/or sum-of-the-year's digits methods allowed under the Internal Revenue Code of 1954?

YES—71.1 Pct
NO—28.9 Pct

Based on 228 replies.

Question: Did your company have facilities certified for fast amortization under section 168 of the 1954 Internal Revenue Code?

YES—33.6 Pct
NO—66.4 Pct

Based on 229 replies.

Question: If so, have these facilities been entirely written off?

YES—44.2 Pct
NO—55.8 Pct

Based on 77 replies.

were used for tax and book purposes.

Pretty much the same sort of response was obtained when the companies were asked if the same set of books would be used if they were allowed to speed up their depreciation rates.

Effect on Profits — A clear-cut majority, 87.5 pct, stated their company would use the faster rates for both book and tax purposes.

Higher depreciation rates, of course, would make short-term profits look smaller. This, in turn, would have an effect on executive profit-sharing, stockholder relations, and the company's credit rating.

But when asked if they were concerned about the effect higher depreciation rates would have on the company's financial position, 72 pct said they were not, while 28 pct expressed some concern.

Action Taken — Just how much has industry taken advantage of the actions the government has already taken to liberalize depreciation regulations?

To find out, The IRON AGE survey asked companies if they had adopted the liberalized depreciation methods allowed under the Internal Revenue Code of 1954.

Two hundred and twenty-eight companies answered this question. Slightly over 71 pct of them had switched their depreciation accounting to the double declining balance or sum of the years digits methods approved under the 1954 code.

First Year Allowance—Less advantage was taken of the "first year depreciation allowance" permitted in 1958 for new production equipment costing up to $10,000.

About 46.6 pct of those surveyed said they had not. The discrepancy between the action taken on the 1958 and 1954 changes may be due to low earnings rates during the 1958 recession. Or the amount involved may not have been enough to consider setting up separate schedules.

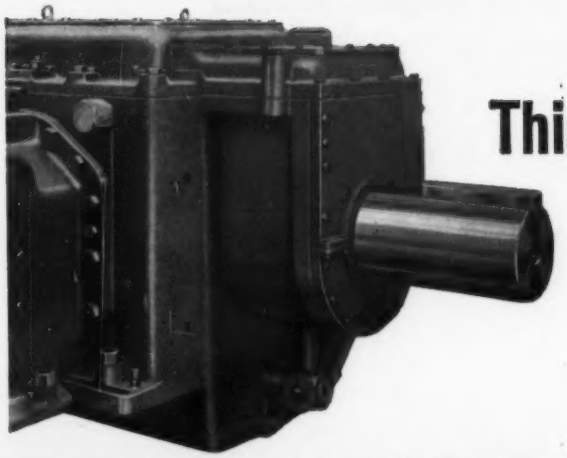
Another interesting sidelight the depreciation survey turned up was the number of companies that had facilities certified for fast amortization under the 1954 Internal Revenue Code.

More to Come—About 34 pct of the 229 companies answering said they had. Of these, some 56 pct said their facilities were not yet entirely written off.

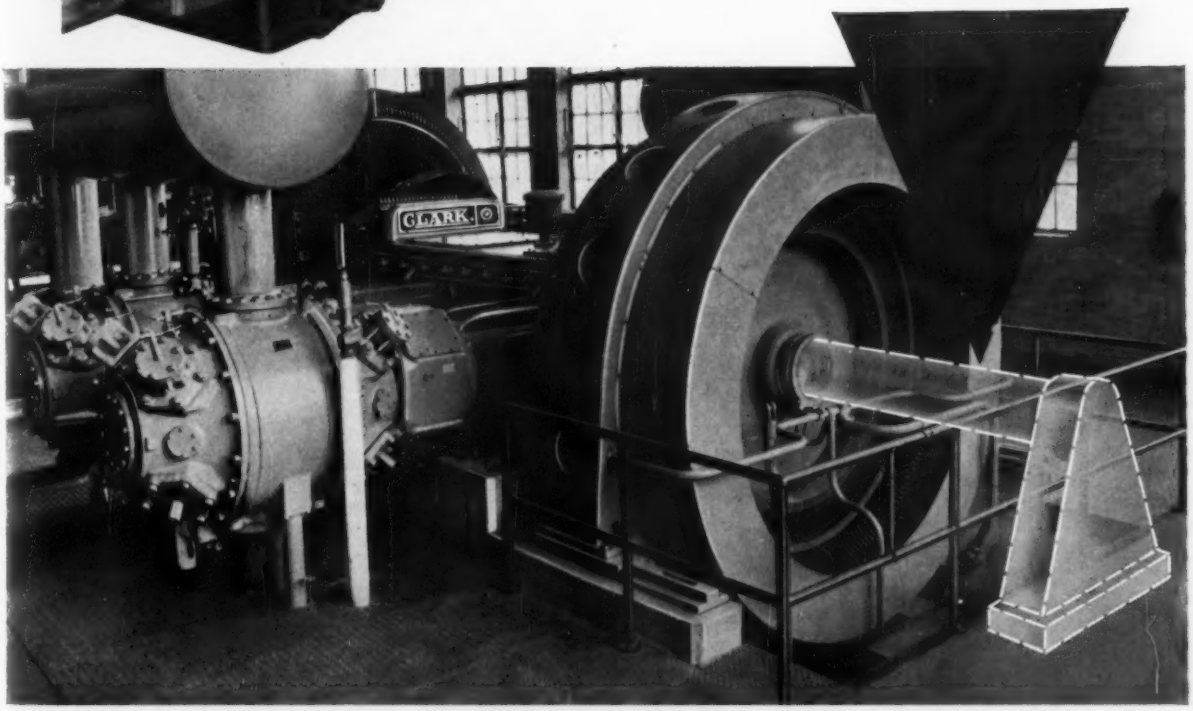
Additional findings of The IRON AGE Survey of depreciation methods will be reported in the next few weeks.

Here you'll learn what some companies are doing to keep auditors and accountants abreast of technological changes and what top industry leaders favor in the way of reform.

Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



This Clark development eliminates outboard bearings



In 10 years, in hundreds of installations, NEVER a motor end-bearing failure!

Since Clark introduced *overhung rotor construction* in its Balanced/Opposed compressors a decade ago, hundreds of these air compressors have been built. Proof of the dependability of this design feature is the fact that not one motor end-bearing failure has occurred in over ten years.

Heavy duty crankcases and generously proportioned crankshafts and main bearings are the main reasons for this proved dependability. Here are additional advantages of Clark overhung rotor design:

EASIER INSTALLATION – Mounting the rotor directly on the crankshaft simplifies installation. Just align the stator to the rotor – that's all.

LESS MAINTENANCE – There is no outboard bearing to be knocked out of alignment. Motor bearing is integral with crankcase, lubrication is automatic. Self-centering of the rotor within the stator removes rotor weight from the bearing during operation.

SIMPLER DESIGN – One piece collector rings. Flywheel effect in most instances is completely built into the rotor thereby eliminating the flywheel.

LESS FLOOR SPACE – Close coupling reduces foundation requirements.

Overhung rotor construction is only one of many features found in Clark Balanced/Opposed Compressors. Review your requirements with your Clark representative for all the facts.

CLARK BROS. CO. OLEAN, NEW YORK

One of the Dresser Industries

ENGINES • COMPRESSORS • GAS TURBINES

CLARK

Experience**—the added alloy in **Allegheny Stainless

Easy-to-form metals with high strength up to 1000 F

AM 350 and AM 355, precipitation hardening stainless steels by Allegheny Ludlum have many advantages for designers of missiles and supersonic aircraft in solving space age problems.

Among their many desirable properties, AM 350 and AM 355 combine high hardness and strength and stability up to 1000 F and yet possess good ductility. They are easy to form in the annealed condition.

They can be spun, drawn, formed, machined and brazed or welded using normal stainless steel procedures.

Both steels have excellent corrosion resistance and good resistance to stress corrosion and oxidation at higher strength levels.

AM 350 is available commercially in sheet, strip, foil, small bars and wire. AM 355, best suited for heavier sections, is available commercially in forgings, forging billets, plates, bars, wire, sheet and strip.

For further information, see your A-L sales engineer or write for the new technical booklet, "AM 350 and AM 355." **Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.**

883

ALLEGHENY LUDLUM

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

What Causes Highway Accidents

Highways, Drivers, Auto Defects All Contribute

Traffic death rate last year was lowest recorded since records were started 30 years ago.

But experts believe the rate can be lowered by better roads, driver training, and auto maintenance.—By A. E. Fleming.

▪ American motorists are the safest in the world. Their traffic record tops every other country. But there's plenty of room for improvement.

In 1958 there were 37,000 traffic deaths in the U. S., 5.6 for every 100 million vehicle miles traveled. The 5.6 rate was the lowest since the recording of such information started over 30 years ago.

The 1958 showing compares very favorably to 1939, for example, when 32,000 fatalities took place, or 11.3 per 100 million vehicle miles. Progress has occurred in recent years even though the number of vehicles in use and the amount of miles traveled have doubled since 1939.

Taillight Troubles — Still the most dangerous part of a person's work day, however, is the time he spends driving to and from his job. Part of the blame lies in the way people care—or don't care—for their automobiles.

For the fifth year in a row, results of the National Vehicle Safety-Check show that 20 pct of the nation's vehicles have at least one flaw that makes them highway hazards.

Rear lights were defective on 30.7 pct of the cars checked. Next in order of malfunction were: front lights 18.8 pct, brakes 17.5 pct, exhaust 8.6 pct, tires 7.5 pct, steering 5.7 pct, windshield wipers 4.7 pct, glass 3.4 pct, horn 2.0 pct, rear view mirror 1.1 pct. For the first time in five years, front lights showed a greater incidence of unsafe condition than brakes.

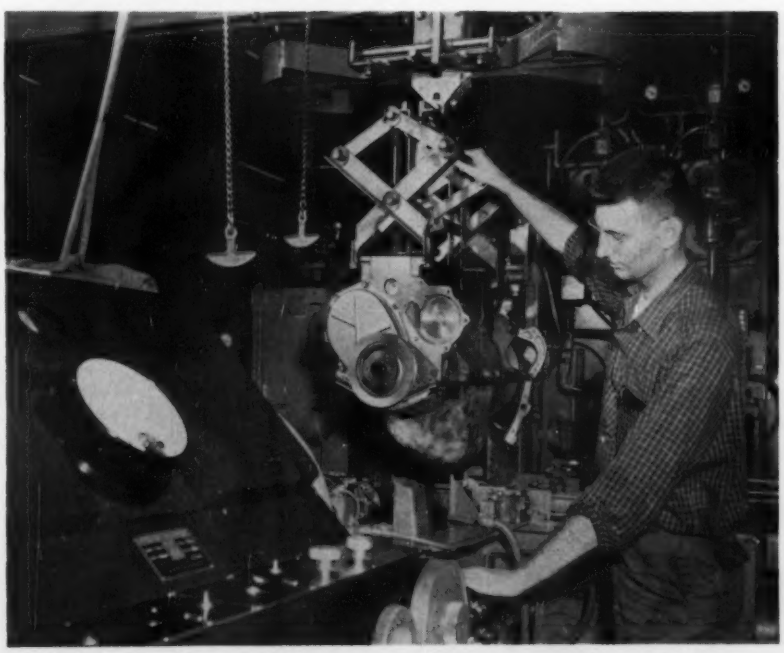
Care for Cars—Trucks had fewer failures on front lights, brakes, tires and steering. But they fared worse on rear lights, exhaust, windshield wipers, glass, rear view mirror and horn.

Crusades are being carried out to make motorists more maintenance conscious. Groups are working to get laws passed that would guarantee severe penalties for unsafe drivers. Pointed out as an example of progress in this direction is Pennsylvania's compulsory vehicle inspection program.

Highways, too, are drawing their share of criticism. According to the American Standards Assn., there is a lack of safeguards on U. S. highways, including turnpikes, that would not be tolerated in any modern industrial operation.

Turnpikes Are Safer—Highway accidents are far higher than neces-

Strong Fingers Lift Hundreds of Horses



FIRM GRIP: Automatic tongs made by Heppenstall Co.'s Materials Handling Div. firmly hold an engine for a 1960 Plymouth as it is transferred to an engine balancing machine at Chrysler Corp.'s Trenton engine plant.

sary, the association says. In 1958, for instance, the injury accident rate on the New York Thruway was 26.2 per 100 million miles. On other New York highways and streets it was above 300.

Current highway problems might be solved, say some groups, by checking accident prevention experiences of private road systems on automotive proving grounds.

An expert in this field, K. A. Stonex, assistant director of the General Motors Proving Grounds, stresses the danger of obstacles in the immediate roadside, as well as drainage ditches and slopes along the roadside.

Fatal Under 40—Much research is still needed before the best in roadside design can be established as a standard, Mr. Stonex says. Guardrails are a major problem. They are needed. But they are highway obstacles which should be resorted to only as a last solution, he says.

But the most important safety factor, as the saying goes, is the driver—the man who controls the machine. An FBI study reports that in 85 pct of all traffic accidents there is no deliberate violation of the law. Most accidents result from lapses in attention or errors in judgment.

The National Safety Council says 87 pct of all accidents occur at speeds under 40 mph. In fatal accidents, four out of five drivers don't exceed the speed limit.

Training Helps—Driver training programs are on the rise to help instill proper motoring habits or to correct improper habits. Forward steps are being made particularly in high school training courses.

Surveys show that youngsters who have taken the complete driver education course have a record twice as good as those who haven't taken it.

Ford Small Cars To Be Made in N.J.

Ford Motor Co. is starting to shift around assembly operations in preparation for the forthcoming Comet. This is the medium-price economy car scheduled for spring introduction.

Mercury production schedules will be increased in St. Louis, Mo., and Wayne, Mich., beginning in December as steel supplies permit. By the first of the year, the new rates will give Mercury dealers more cars than they've had available in any month since May, 1957.

Mercury Shifts—When the new rates are reached, the company will begin converting the Metuchen, N. J., assembly plant to production of "economy-size" cars—the Comet and Falcon. Falcon output will start there about mid-February.

To make the changeover possible without losing any Mercury production, the rate at St. Louis will be nearly doubled. Wayne's output will climb 40 pct. At that point, Mercury's production will be 15 pct above present, including the units now built at Metuchen.

Falcons are now assembled at Lorain, O., and Kansas City, Mo. Mercurys also are made at Los Angeles.

The Bull of the Woods

HE TOOK NINE SECONDS TAKIN' TH' GLOVE OFF TO SCRATCH HIS EAR, AN' FOURTEEN SECONDS TO PUT IT BACK ON AGIN--NOW WATCH! HE'S TAKIN' IT OFF AGIN, TO TAKE A CHEW O' T'BACKER! ONE-TWO-THREE--
YES, SIR! IT DOES TAKE TIME, DON'T IT?
I'D OF NEVER THOUGHT OF THAT!
HE'S PROVIN' THAT A GUY WHO WEARS GLOVES TO WORK IN AIN'T MUCH GOOD TO TH' COMPANY!
WELL, A GUY WHO TAKES TIME TO PROVE IT AIN'T MUCH GOOD TO TH' COMPANY EITHER, IS HE?
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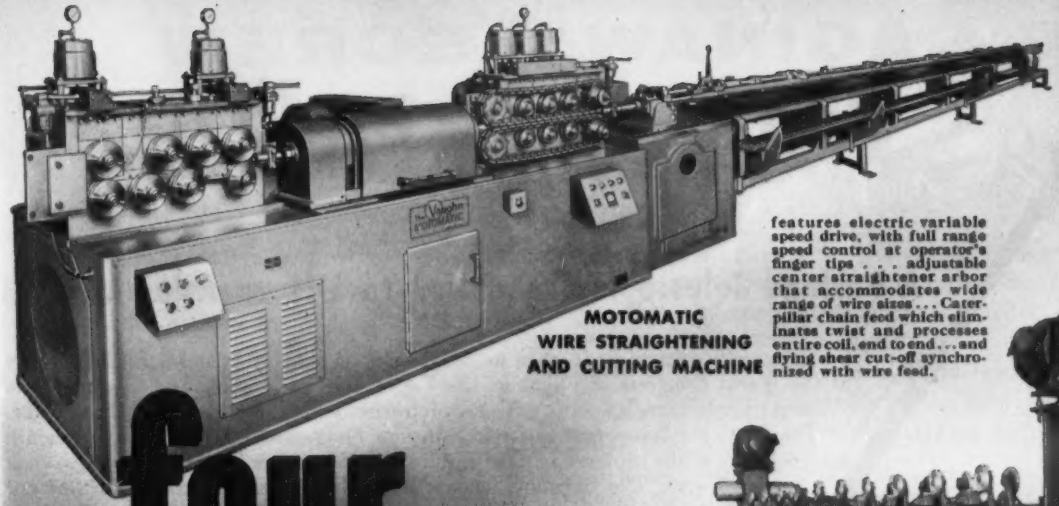
THE OBSERVING GUY

GM Plans High Output

General Motors will make every effort to catch up on auto production lost because of the steel strike, says president J. F. Gordon.

"In fact, as soon as the steel industry gets back to normal," he says, "it looks as if the production rate of the various makes of cars would be limited only to the availability of steel and the ability of each to meet the competitive values of the others."

The GM president says high sales of cars in 1960 will depend upon the general level of business and a continuation of consumer confidence. He reports it's still too early to tell what effect introduction of American smaller cars will have on the overall market. But he expects standard size automobiles will remain the backbone of the industry.



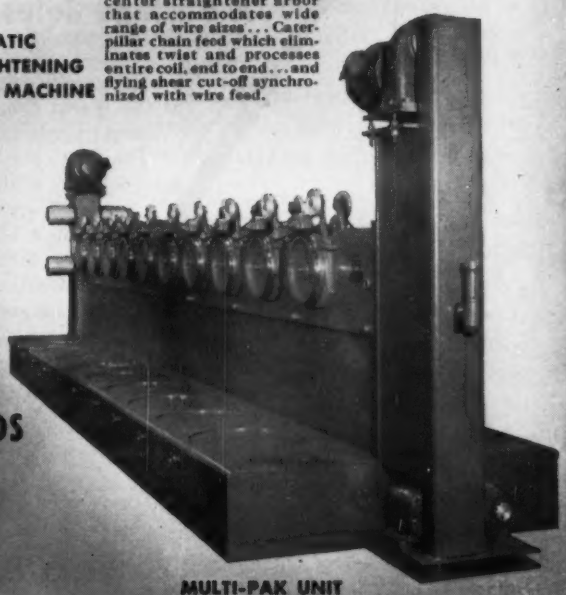
MOTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE

features electric variable speed drive, with full range speed control at operator's finger tips . . . adjustable center straightener arbor that accommodates wide range of wire sizes . . . Caterpillar chain feed which eliminates twist and processes entire coil, end to end . . . and flying shear cut-off synchronized with wire feed.

four NEW VAUGHN PRODUCTS

TO MEET THE WIRE INDUSTRY'S DEMANDS

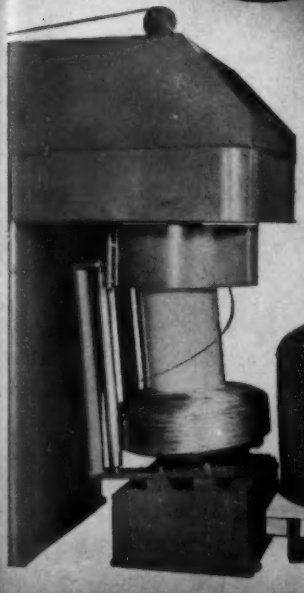
- *for high speed, heavyweight coils . . .*
- *for wire laid in pay-off packs . . .*
- *for straight, precision-cut length wire . . .*



MULTI-PAK UNIT
(20 strand)

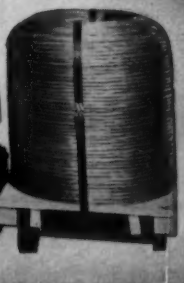
for faster, more efficient laying of wire in pay-off packs, drums or pails

MOD Vaughn EQUIPMENT

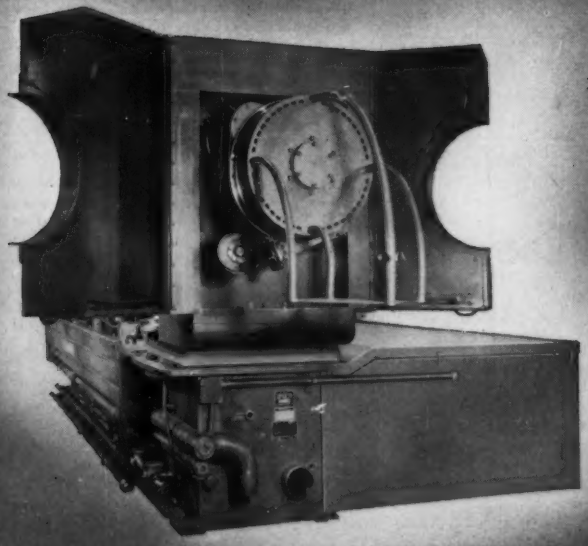


STATIONARY BLOCKS

for drawing and/or coiling to provide heavy weight compact coils. Available in either horizontal or inverted vertical designs.
16½ Gauge Galvanized Low Carbon Wire • Coil Weight—1611¢
Coil I.D.—14" • Coil O.D.—39"
Coil Height—39"



Large Size Wire Bundle made on Stationary Block



STATIONARY DRAWING BLOCK CONVERSION UNIT

which can be substituted for conventional finishing block on existing MOTOBLOK, to provide continuous drawing of heavy weight coils at high speed.

The VAUGHN MACHINERY COMPANY

CUYAHOGA FALLS, OHIO

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys

THE SAGINAW b/b SCREW

SAVED THE DAY

WHEN...

A Garland Telescopic Crane Had to Lift an Atlas Missile!

"We were *really* up against it when we had to put up a 3-ton Atlas Missile for display at the World Congress of Flight in Las Vegas. Our telescopic crane was unable to "boom up" that much weight, with the high-friction threaded shaft we'd been using. Thanks to the competent assistance of your factory representative, and prompt delivery of the proper Saginaw Ball Bearing Screw, we licked the problem over a week-end. The Saginaw Screw's 90%-plus efficiency *actually tripled* our crane's boom-raising capability! It even brought us a *second* order from the Air Force. We're not only going to add Saginaw Screws to every new Garland crane, but install them in every one of the 1200 Garland cranes already in use!" says *Carl Frye, Sales Manager, Garland Crane Co., Long Beach, California.*

Perhaps the Saginaw b/b Screw can give *your* products that greater Sales Appeal you're looking for. Want details? Just write or phone Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—*world's largest producers of b/b screws and splines.*

The Saginaw b/b Screw converts *rotary* motion into *linear* motion with over 90% efficiency. Saves power, space, weight, gives day-in, day-out dependability.

Boom used to raise Able into position for fastening onto Thor missile.

A Size and Type for Every Need...

Have been built as small as 3/16 in. B.C.D. and 1½ in. long, as large as 6 in. B.C.D. and 40 ft. long. Larger sizes can be built to your order.

Saginaw ball bearing Screw

WORLD'S MOST EFFICIENT ACTUATION DEVICE

Ike Wants Strict Strike Rules

The Administration will ask Congress to pass stricter wage dispute rules next year.

A new addition to fact finding boards might be "public" representation.—By G. H. Baker.

▪ Future national wage disputes will be jarred loose very early by government fact-finding boards, if the White House has its way next year.

In theory, no dispute will be permitted to reach the strike stage.

The Eisenhower Administration is now writing some strict new rules for settling wage disputes. Congress will get a look at them early in 1960.

Public Member — Keep an eye on this all-important point, however: A provision for so-called "public" representation on each fact-finding board. In the past, "public" members of boards have tended to side with labor representatives and against management.

Congress can be expected to take a good hard look at this proposal for setting up tripartite (unions, management, public) boards. Union officials want it that way. They know their chances for getting what they want are greatly improved with a labor-management-public board, as against a labor-management board.

Recommendations? — Another prickly issue to be settled by the Congress is whether or not fact-finding boards ought to have the power to recommend settlement terms.

It's an easy game, telling somebody else how to spend his money. Recommending higher wages doesn't require much statesmanship, when the recommender doesn't have to pay them. Challenges to this provision (recommending settlement terms) will be raised within the Congress next year.

Stronger Proposals — Actually, the Administration plan will be mild compared to some other proposals that will be made in the Congress. Senator Wayne Morse, D., Ore., for example, says he'll back legislation providing for seizure of an entire industry by the President. Seizure would be for 60 days, and could be extended by the Congress. Income during this period would be held by the government. Owners would be paid "just compensation," whatever that is.

Small Businesses May Get Some Tax Relief

Small business firms stand the best chance in years of getting some tax relief in 1960.

The House Ways and Means Committee is now conducting a broad study of all tax laws. Its first objective is to close "loopholes" which permit favored groups to escape paying their fair share. This raises taxes for the bulk of the taxpayers.

It is also seeking to correct unfair taxes and to remove those which penalize some taxpayers because of special circumstances. Small firms are among those penalized by the tax laws, experts say.

Among the possibilities of congressional action are: Measures to permit self-employed persons to deduct funds set aside for retirement; ease the inheritance tax which now causes many mergers and permit tax deductions for reinvested profits.

There are many proposals which could hurt small firms. Budget problems are working against an across-the-board tax cut.

Should Board Suggest Terms?

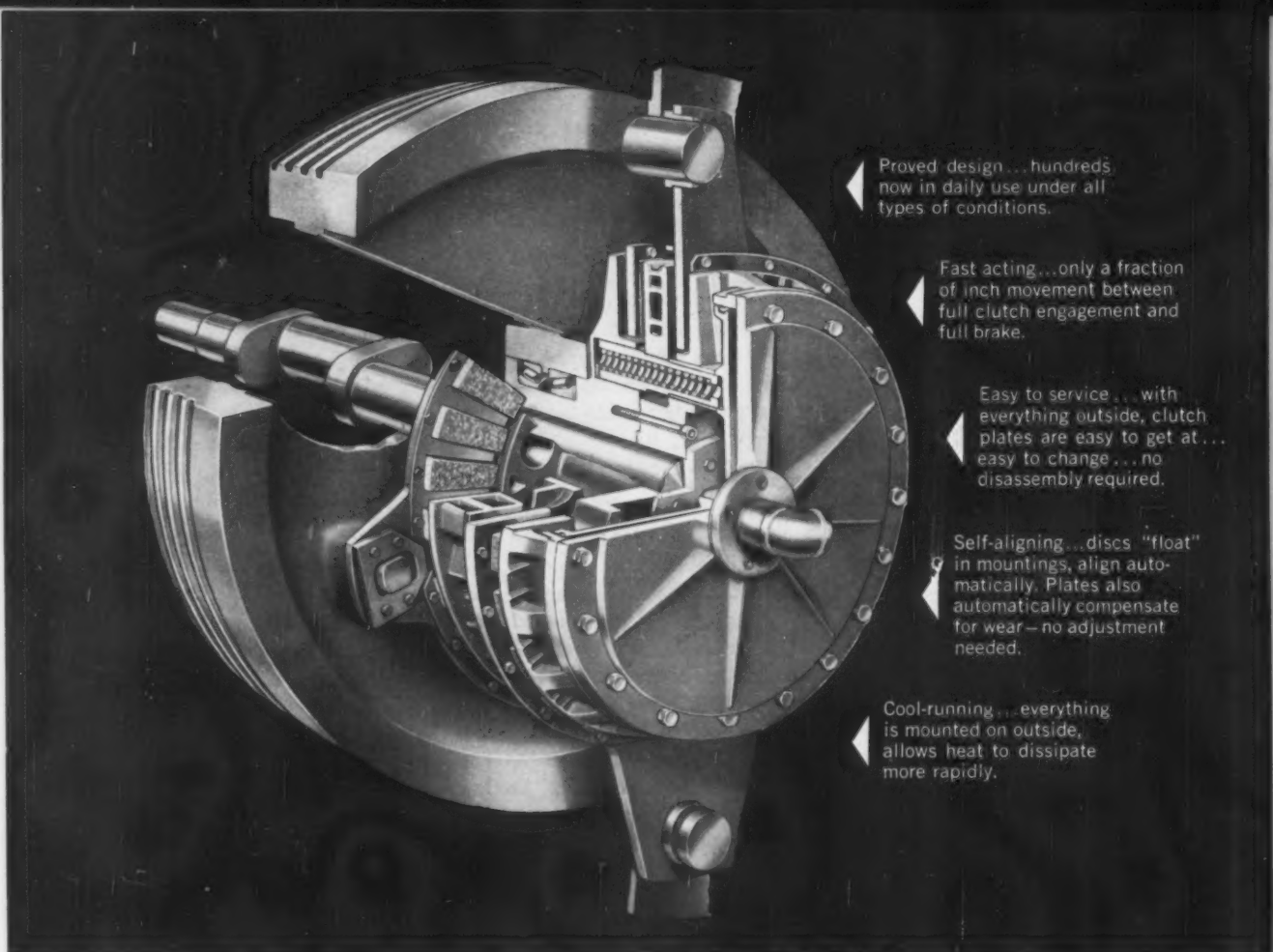
▪ Steel fact-finders named by the White House should be authorized to recommend terms of settlement if the strike is not settled 10 days before the injunction expires, says Sen. Strom Thurmond, D., S. C.

At present, the fact-finders have no authority to make any recommendations for settling disputes.

This is a mistake, says Sen. Thurmond.

Here's Why — His reasoning: Recommendations from any White House fact-finding board are widely publicized. Public opinion then would be aroused on the side of settlement—on the basis of the recommendations. From a practical point of view, this would therefore be equivalent to compulsory arbitration, but without the dangers of enforced settlement by an arbitration board.

Further, says Sen. Thurmond, there is a crying need for decentralization of bargaining. He favors a return of bargaining to the workers and to the local areas. Nationwide bargaining can only mean nation-wide settlements, which inevitably are going to lead to government-imposed settlements, he predicts.


Proved design... hundreds now in daily use under all types of conditions.
Fast acting... only a fraction of inch movement between full clutch engagement and full brake.
Easy to service... with everything outside, clutch plates are easy to get at... easy to change... no disassembly required.
Self-aligning... discs "float" in mountings, align automatically. Plates also automatically compensate for wear—no adjustment needed.
Cool-running... everything is mounted on outside, allows heat to dissipate more rapidly.

New Bliss combination clutch and brake for inclinables...

RUNS COOLER UNDER TOUGH OPERATING CONDITIONS
SINGLE TRIPS FASTER... ALWAYS TOP STOPS!

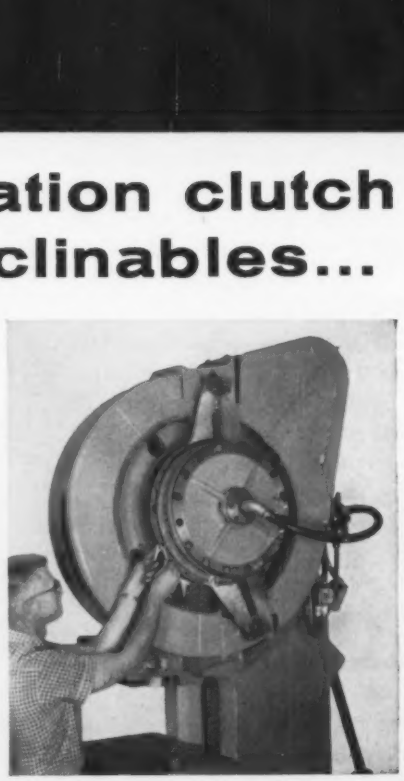
Here is a new combination clutch and brake that is rewriting the standards for inclinable press production.

It's an exceptionally fast operating clutch... one that licks the usual maintenance problems associated with high speed clutches.

Everything is mounted on the *outside*... the clutch is thus kept in open air *away* from the press frame... it dissipates heat far faster and there is no danger of bearing oil getting on the clutch plates—both factors that contribute to longer life.

An equally important feature is its universal top stopping. It practically eliminates the possibility of damaging dies through double-tripping; the new CK top stops every time; ram and feeds are always in synchronization.

Bliss' new CK clutch is designed for crankshaft mounting on flywheel inclinables and main gear mounting on geared inclinable presses. In either case, it runs faster *longer*. Why not get the complete facts on this important new development today?



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How to Share in Army Contracts

Even Small Subcontractors Can Crack This Market

Army Engineers Corps will award contracts totaling $435 million in the West this fiscal year.

You don't have to be a big prime contractor to get some of the work. Here are a few tips.—By R. R. Kay.

▪ Are you alert to the metalworking sales that can be made through the U.S. Corps of Engineers?

Contracts totaling $235 million will be placed during this fiscal year by the Army Engineers in the South Pacific Division. (This covers the states of California, Nevada, Utah, and Arizona.)

Of this amount, spending for civilian projects alone will run close to $70 million. California will get "at least 95 pct" of the outlays for non-military work, a Corps spokesman told The IRON AGE.

Northern Views—Contracts let in the North Pacific Division this year also will run well in excess of $200 million. This district covers Oregon, Washington, Idaho, Western Montana, and all of Alaska.

A healthy percentage of the overall spending goes for large amounts of steel used in bridges, dams, missile launching devices and other items included in heavy construction work handled by the Engineers.

How to Share—You don't have to be a big prime contractor to share in this business. Subcontractors and material suppliers are invited to bid on projects directly.

Some jobs, too big for one firm to handle, can be joint ventures. Several companies—big or small—can bid together.

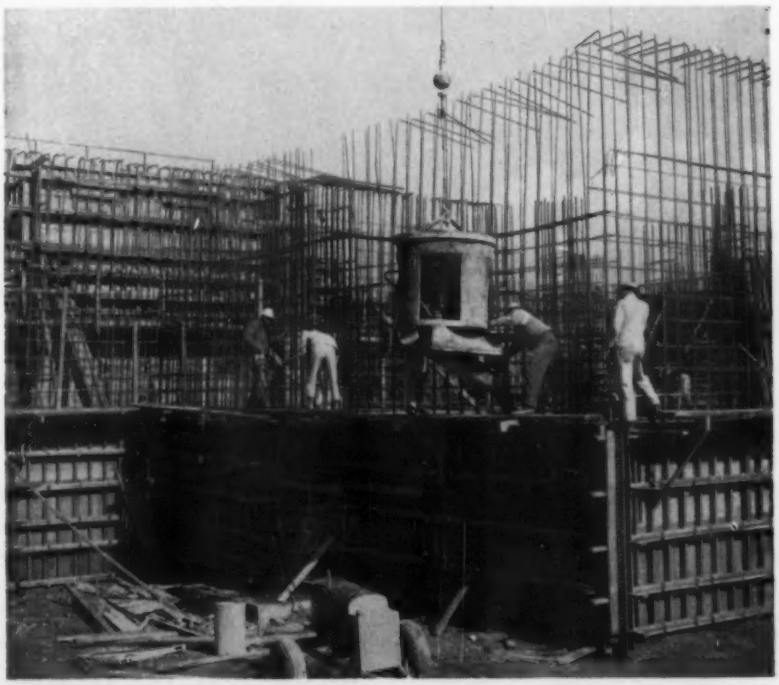
Another approach: Attach yourself to a successful subcontractor for a share of his portion of a project. Each district office gladly offers lists of bids submitted—a golden opportunity for suppliers looking for sales leads.

Better still, ask to be put on the district's advance notice list. Then you'll be alerted when bids are invited on a particular job. Prime contractors and subcontractors will welcome you. "They always have to have steel suppliers lined up when they bid," the Corps spokesman said.

Help Available—For the small operator who wonders how to go about looking for this Army Engineer business, each district office has a Small Business Specialist whose only job is helping small firms.

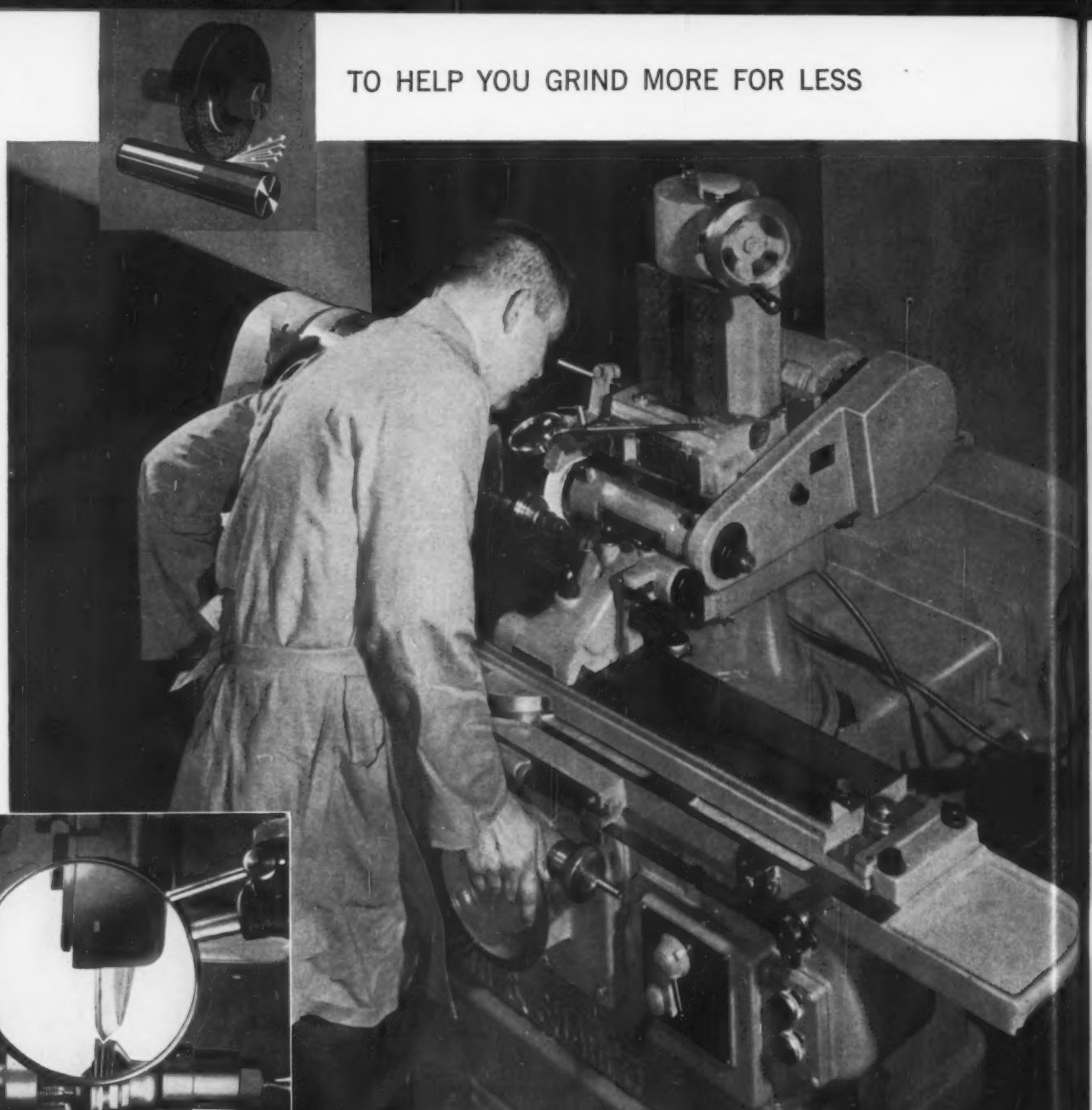
West Coast district offices are located in San Francisco, Los Angeles, and Sacramento. There are also offices in Portland, Seattle, Walla Walla, and Anchorage, Alaska.

Re-bar Adds Strength to Launcher



SOUND FOUNDATION: Reinforcing bar in concrete walls of missile launcher will help structure withstand great stresses of launchings. Atlas launcher is located at Vandenberg Air Force Base, Calif.

TO HELP YOU GRIND MORE FOR LESS



Two-machine output from single-machine investment-
No. 13 tool grinder doubles for production

The Brown & Sharpe No. 13 Universal and Tool Grinding Machine is the leading choice in its class for all-around utility. Watch it turn out the work anywhere it's installed, and you'll see why.

It grinds helical and formed cutters, end mills and side mills—meets every need for tool sharpening. It is industry's favorite for circular form tool grinding. It offers unlimited adaptability for tool and die making, and for grinding parts needed in experimental, prototype, and repair work. In addition, it has ample capacity for a wide variety of light production grinding.

Now, new improvements in drive design further increase its proved efficiency. Find out how the No. 13 can start saving for you.

For details, write: Machine Tool Division, Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.

Brown & Sharpe PRECISION CENTER

The Threat From Foreign Machine Tools:

Exports Are Off (Decline from 1952 to 1958)	
Engine Lathes	—52.6 pct
Turret Lathes	—59.9 pct
Chucking Machine	—41.2 pct
Cylindrical Grinders	—49.9 pct

Imports Are Up (Share of U.S. Market)	
1951	1.4 pct
1958	4.7 pct
1959 (4 mos)	6 pct

and U. S. Builders are Underbid		
Machines	U.S. Bid	Foreign Bid
Standard Lathe	$ 13,249	$ 8570
31 Shapers	$216,565	$112,995
4 Stand. Grinders	$130,206	$ 82,206

Reds Outstrip U.S. Toolmakers

In 1958 Russia was making four tools for every one built in the U. S., says State Dept.

NMTBA's Ralph Kraut also cites problems from other foreign builders the U. S. industry must solve.—By R. H. Eshelman.

▪ Russia made four machine tools to U.S.'s one in 1958, according to the State Department. The gap may be even wider today.

Do these figures signal a fatal slide of our productive capacity? Not yet, perhaps. But soon, unless the trend is reversed, says Ralph Kraut, 1959 president of the NMTBA. And by their own words, Communists leaders are girded for a showdown production battle to win men's minds.

Russian Edge — Economic experts at the builders' annual meeting cited further figures: Russian productivity grows at about an 8 pct annual rate; ours at 3 pct or less.

In a letter to the Office of Civil & Defense Mobilization, the U.S. builders' association warned that "the metalworking industries of our country are still trying to meet the competition of tomorrow with the machine tools of yesterday." The letter emphasized the direct relation between machine tools and national defense.

This threat to national security, the association explains, includes the mushrooming of European and Russian machine tool capacity, as well as decline of American machine tool output. (See box)

U.S. Exports Off—Equally as bad for the state of the industry is the decline of American machine tool exports. Traditionally, exports account for a large part of U.S. machine tool output. But exports today are a mere shadow of their former volume.

"As a result of the increased competition from low-cost labor imports, and the shrinking export market," Mr. Kraut said, "the U.S. machine tool industry has begun to move abroad." According to Association surveys about 50 American builders now have foreign manufacturing arrangements. It's probable that American companies with foreign operations are more than 75 pct of domestic capacity.

Paradox—"One of the paradoxes of this whole situation is that the U.S. Foreign Aid program has contributed to up-building of European machine tool industries which now represent our most serious competition," Mr. Kraut asserted. "What is to be the outcome? Is the U.S. to become merely a secondary producer in the machine tool field? Is the great bulk of the world machine tool capacity to be located abroad, chiefly in Europe, where it might be overrun in one day's push from Russia. From a national defense standpoint, such a possibility is appalling."

To overcome the difficulties Mr. Kraut calls for a five-step program:

1) Halt inflation.

2) Balance government budgets and cut taxes.

3) Change our unrealistic depreciation policies.

4) Provide temporary protection for American industry against low foreign wage rates.

5) Drop our complacency and get to work.

Some developments that may reveal trends in this struggle: Meetings between NMTBA and a European tool committee on the Red threat, activities of a new manufacturing committee set up by NMTBA, exchange of tool missions between Russia and the U. S.

INDUSTRIAL BRIEFS

Increased Sales—The Midland-Ross Corp., Cleveland, has acquired Surface Combustion Corp. for $23 million in cash. Sales of Surface, including Janitrol, have averaged about $45 million in the last five years. Estimated sales of the combined organization in 1960 should be about $120 million.

Sea Lore—The Lewis Welding & Engineering Corp. has formed a Marine Products Div. for the manufacture and sale of automatic hatch covers for cargo ships. "Auto-Hatch" is a hydraulically operating hatch covering system developed by Cleveland Pneumatic Industries, Inc., and will operate under a licensing agreement with Cleveland Pneumatic.

Liquid Products—Air Reduction Sales Co. is building a new air separation plant at Baton Rouge. It will cost over $2 million. The plant will have a production capacity of 30 tons of liquid oxygen, nitrogen and argon per day. The installation will serve all of the industries in the Gulf State area.

Philadelphia Story — The Air Force has awarded General Electric a $101 million contract to continue development of advanced re-entry vehicles for Thor and Atlas ballistic missiles. The work will be performed at Missile and Space Vehicle's headquarters in Philadelphia.

Contract Launched—An additional $5.2 million order has been awarded Westinghouse Electric Corp. under a U. S. Navy contract. It is for initial work on launching systems equipping four nuclear-powered submarines to fire the ballistic missile, Polaris.

To the Suburbs—Bickley Furnaces, Inc., designer and builder of high temperature furnaces and kilns, has moved from its quarters at Richard C. Remmey Son Co., Philadelphia. It is now operating in its new office and factory building in suburban Philadelphia.

Oxygen for Steel—A new oxygen producing plant has been built at Lukens Steel's Coatesville, Pa., works. The plant was built and will be maintained and operated by Linde Co. Most of the 110 tons of oxygen produced per day will be used in openhearth and electric furnace steelmaking.

Aluminum Housing—Allis-Chalmers is producing all-aluminum housing for outdoor switchgear. It was developed jointly by Allis-Chalmers and Reynolds Metals Co. The new enclosure is made of extruded aluminum sections which interlock to form structurally reinforced panels.

North Country—Rockwell-Standard Corp. has expanded operations of its Canadian subsidiary, Rockwell-Standard Corp. of Canada, Ltd. The Canadian company has acquired a manufacturing plant at Tilbury, Ont.

Name Changing—Steel Service Center Institute has been adopted as the new title of The American Steel Warehouse Assn. The name change reflects more accurately the functional scope and technical competence of the steel industry.

Growing Bigger—Crane Co. has expanded its fabricating facilities in the U. S. and Canada. The company has acquired Pipe Fabricators, Inc., E. Chicago, and Canadian Pittsburgh Piping, Ltd., Hamilton, Ontario. Canadian Pittsburgh Piping, Ltd. becomes a subsidiary of Crane, Ltd. It will be known as Crane Piping Ltd.

"I looked over your model, Cranston, and now I suppose you're wondering if I liked it or not."

Enlargement—The New England Alloy Casting Corp., has acquired all facilities of the Hartford Electric Steel Corp., Hartford, Conn. New England Alloy Casting Corp., a newly formed company, is a subsidiary of Quaker Alloy Casting Co., Myerstown, Pa.

Distributors—Motch & Merryweather Machinery Co., Cleveland, machine tool builders and distributors, have been named area distributor for Cleveland-Detroit by Micro-Path, a magnetic tape automatic control for machine tools.

Southern Buy — Toccoa Metal Products & Implement Co., Inc., Toccoa, Ga., has purchased all of the box line of tools, inventory and the name Swanco and Swanco Line from Swanson, Inc., Monroe, Ga. The company name will be Swanco Div. of Toccoa Metal Products Co., Inc.

Just Opened—A new firm of consulting engineers, Dorr Consultants, has been formed to provide engineering, financial, and management services to the chemical process, textile, and metallurgical industries. Headquarters of the new organization are at 99 Park Ave., New York.

Shipments Up — The fabricated structural steel industry continued to draw from its inventory during October. It shipped 195,313 tons of structural steel for buildings and bridges. According to the American Institute of Steel Construction, October shipments were 7 pct better than the previous month.

Talking Turkey—Three U. S. firms will build a steel mill in Eregli, Turkey. Companies ininvolved in the project are Koppers Co., Westinghouse Electric International Co., and Blaw-Knox Co. The initial $185 million installation is scheduled to begin production in 1963.

Cold Rolled Shear Lines at Pittsburgh Steel Company.

Sheet and Strip Finishing Equipment

COILING - UNCOILING

TRIMMING OR SLITTING

SHEARING - LEVELLING

PILING OR COILING

PICKLING OR CLEANING

SCRUBBING, DRYING
CONVEYING

• Aetna-Standard builds equipment for processing any conventional size or weight of sheet and strip.

The diversified line includes Side Trim and Shear Lines; Automatic Gaging and Classifying Lines; Slitting Lines; Scrubbing and Drying Lines; Coil Preparation Lines; Anneal and Pickle Lines; Shears, Coil Boxes, Up-coilers, Levellers, Pay-Off and Tension Reels; Pilers and the patented Kauffmann Sheet Classifier.

Aetna's equipment is recognized as equipment "built for 21-turn operation".

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Aetna-Standard Division
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FOUNDRY DIVISION

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M. R. McLary, elected executive vice president and manager, Ingersoll Products Div., Borg-Warner Corp.

Borg - Warner Corp., Ingersoll Products Div.—**H. A. Schmeal,** elected vice president, treasurer and secretary.

Hayes Steel Products, Ltd.—**V. R. Kaufman,** appointed president.

The IBM World Trade Corp.—**J. E. Brent,** elected executive vice president.

The Levinson Steel Co.—**B. M. Levinson,** appointed assistant to the president.

Chemetron Corp., Cardox Div.—**C. E. Wolfe,** appointed a vice president.

Verson Allsteel Press Co.—**H. L. Reynolds,** appointed vice president and district manager, Wisconsin district sales office; **D. J. De Carlo,** appointed manager, Contract Dept.

American - Standard Industrial Div.—**J. F. Tobin,** appointed vice president, marketing.

Acme Industries, Inc. — **W. M. Hassenplug,** elected to the board of directors; **R. C. Robertson,** promoted to vice president, sales.

American Chemical & Refining Co., Inc.—**George Dietz, Jr.,** named executive vice president and general manager; **Q. A. Dietz,** elected vice president and general sales manager, marketing and sales program; **N. W. Mitchell,** named director, research and development.

Vitro Minerals Corp.—**E. B. Hotchkiss,** named executive vice president.

U. S. Steel Corp.—**J. L. Sorensen,** appointed division superintendent, general services, Gary Steel Works, Gary, Ind.

Jones & Laughlin Steel Corp.—**H. R. Johnson,** appointed asst. general manager, sales, New York district sales office; **John O'H. Anderson,** named consultant to the asst. general manager, sales, New York; **W. F. Donaldson, Jr.,** named manager, tin mill products, Pittsburgh; **A. C. Pollock, Jr.,** becomes Cincinnati district sales manager.

J. F. Knight, appointed manager, operations, Kaiser Refractories & Chemicals Div., Kaiser Aluminum & Chemical Corp.

Republic Steel Corp. — **L. R. Silliman,** appointed superintendent, Steel Conditioning and Finishing Depts., Buffalo plant.

Armco Steel Corp.—**V. W. Jones,** named asst. to general superin-

(Continued on P. 100)

Kermit Kuck, elected executive vice president, The Monarch Machine Tool Co., Sidney, O.

R. A. Barr, elected vice president, Refractories Div., The Babcock & Wilcox Co.

L. H. Whitney, appointed senior vice president, The Hanson-Whitney Co., Hartford, Conn.

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Tempilstik°—a simple and accurate means of determining preheating and stress relieving temperatures in welding operations. Widely used in all heat treating—as well as in hundreds of other heat-dependent processes in industry. Available in 80 different temperature ratings from 113°F to 2500°F . . . $2.00 each.

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132 West 22nd St., New York 11, N. Y.

(Continued from P. 99)

tendent and **Harry Holiday,** appointed asst. general superintendent, steel plant, Middletown, O., works; **Kenneth Haley,** becomes superintendent, blast furnace; **Donald Grimes,** becomes superintendent, store, salvage and store records.

John Powers, appointed manufacturing manager, Verson Allsteel Press Co., Chicago.

J. L. Scarry, appointed general superintendent, Ambridge, Pa., plant, A. M. Byers Co.

Kaiser Steel Corp.—**A. G. Grey,** appointed asst. general sales manager, administration; **C. F. Cooper,** appointed asst. general sales manager, solicitation.

Bay State Abrasive Products Co.—**F. C. Stockinger,** appointed sales manager.

General Electric Co., Apparatus Sales Div.—**J. B. Land,** appointed manager, industrial sales, Cincinnati office.

Westinghouse Electric Corp.—**L. L. Grant,** named marketing manager, Semiconductor Dept.

The Cleveland Crane & Engineering Co., Cleveland Tramrail Div.—**James Turk,** appointed midwest district sales manager.

R. Y. Moss, appointed general manager, Toledo Scale Div., Toledo Scale Corp., Toledo, O.

(Continued on P. 104)

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Most Complete Stock in America of

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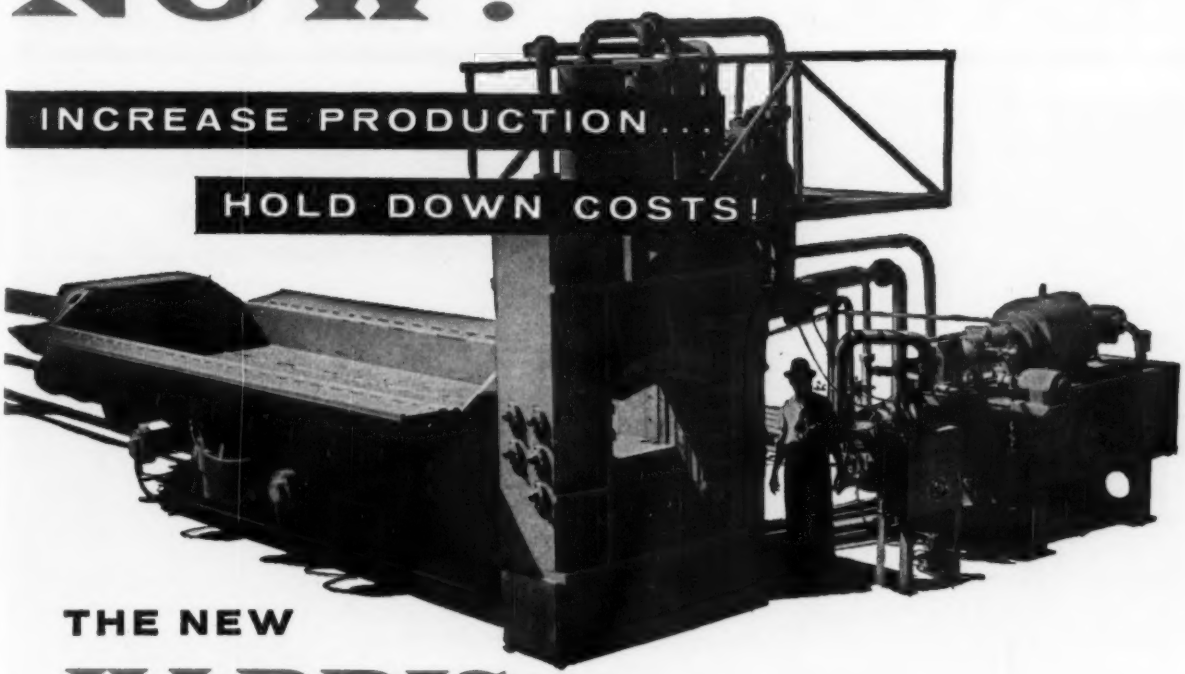
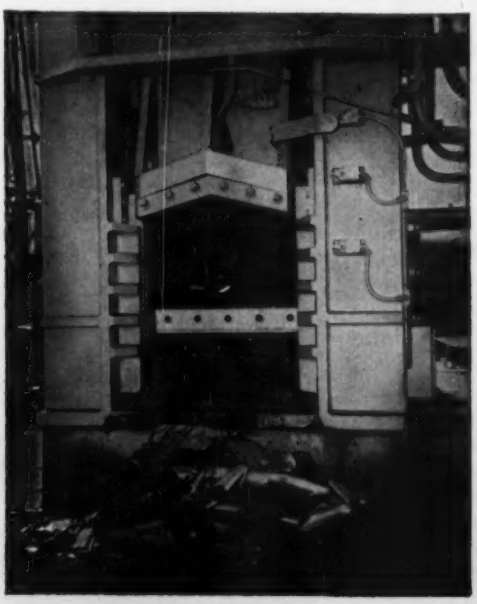
INCREASE PRODUCTION . . .

HOLD DOWN COSTS!



THE NEW HARRIS BS-350 BALER-SHEAR

AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA

▶ *Talk with a Man from Harris*

Lubrication

NEW GREASE WITH EP PROPERTIES TAKES 700°F TEMPERATURES

In three years of field testing, a unique new grease called Thermatex EP 1 has:

—lubricated plain bearings operating at 700°F.

—regularly withstood steam pressures of 125 psi at 300-325°F for 20 hour periods.

—effectively lubricated equipment handling corrosive chemicals.

—resisted coking and solidifying in steam joints where temperatures reach 400°F.

Advantage lies in unique combination of properties

Users agree that the major benefit of Thermatex lies in its unique combination of extreme pressure properties with high heat resistance. While several greases now on the market have one property or the other, Thermatex is believed to be the first which effectively combines both.

Maintenance savings stressed

The use of Thermatex has already helped slash maintenance costs in a surprisingly wide number of applications. To indicate its potentialities —here's what happened when it was used in the steam joints of a paper drier machine: The previous grease used by a West Coast paper manufacturer would invariably solidify and coke in the last few feet of its supply line under the 400° heat. These failures occurred as often as every two weeks.

Three years ago, Texaco persuaded the manufacturer to give the experimental grease a trial. Since then, according to the user, no lubrication failures whatever have occurred, and no evidence of coking or plugging has been recorded.

Capabilities and limits

Information now available shows that Thermatex EP 1 will lubricate satisfactorily at 450-500°F when relubrication occurs every 3 or 4 days. It will provide adequate protection at 550°F with more frequent lubrication periods. Over this figure, the grease's useful lubricant life is measured in hours, but a centralized pressure system can still insure completely adequate lubrication.

For complete information and test results, check the coupon.

Oil mist lubrication gaining wide acceptance

Lubrication by means of an oil mist or fog is rapidly proving its advantages in many types of industrial machines. According to plant engineers, use of oil mist can provide a relatively inexpensive, truly centralized lubrication system.

How it works

In this type of system the oil is atomized into extremely fine particles—less than 2 microns in diameter. The resulting fog can be carried long distances through straight pipes and around bends without any appreciable condensation. The oil condenses only on fast moving parts —where it is needed. On slower moving parts reclassification fittings are used to produce either spray or droplets.

Advantages are significant

Proponents of oil mist lubrication cite a number of advantages the system has over conventional lubricating methods. They include the following:

Use of oil mist eliminates the danger of drippage which might contaminate the material being processed. Points which are hard-to-get-at or in dangerous locations can be lubricated from one convenient spot.

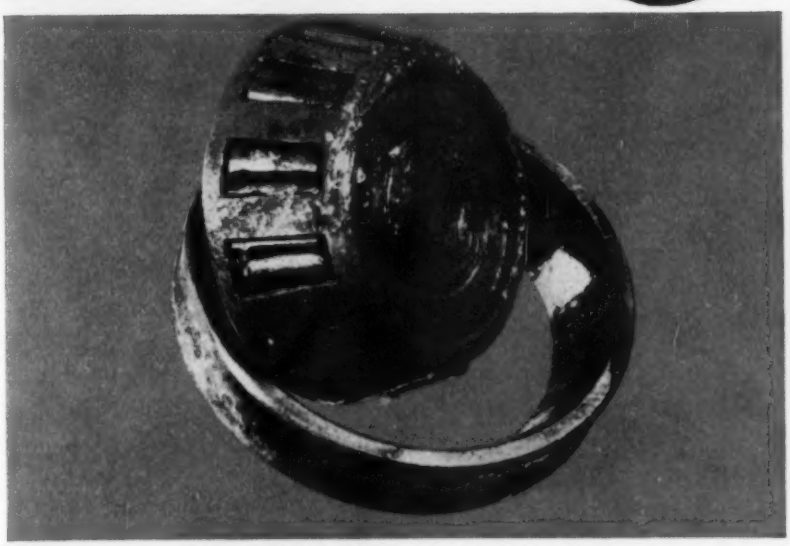
Positive air pressure in the system tends to check the entrance of contaminants such as water, dirt and abrasives—while the air itself provides some cooling effect.

Choice of oil is important

Experts offer a word of caution when it comes to selection of the oil. To be avoided are oils containing graphite, latex, insoluble soaps, fillers or other solids. Best choice seems to be an oil with viscosity at 100°F. (SU) of not over 1,000 seconds.

Texaco products tested and recommended for oil mist applications include Regal Oil PC R&O, Regal Oil C R&O and Meropa Lubricant 1. Test results for these and other recommended Texaco oils are available. Check coupon at right.

news



The difference between Fe_2O_3 and $Fe_2O_3H_2O$ exonerated the lubricant in this bearing failure.

Deposit analysis can uncover surprising reasons for failure

When equipment fails, industry's natural tendency is to blame the lubricant. For this reason, samples of oils and greases—often no more than mere specks—sections of failed gears, bearings, and other ruined pieces of equipment are analyzed at the Texaco Research Center, Beacon, N. Y. Here they are subjected to a searching analysis by technical service experts using a tremendous variety of apparatus and procedures.

Lubricant is seldom guilty

Of the numerous samples submitted every year, the lubricant is guilty in less than 1% of the cases. Take a typical example:

A customer submitted the roller bearing illustrated above. The bearing and its lubricant were liberally contaminated with both red and black material. X-ray diffraction analysis disclosed that the contaminant was an alpha ferric oxide which is characteristic of fretting corrosion—usually correctable only by a design change. Had ordinary rusting occurred the contaminant would have been hydrated ferric oxide—and a finger could have been pointed at the lubricant for allowing water to come in contact with the bearing.

The March, 1958, issue of Lubrication Magazine contains a fascinating series of these "detective" stories. Write for your copy; the supply is limited.

Explains Significance of Lube Tests

The October issue of Lubrication Magazine is designed to give the lubricant user new insight into the significance of lubricant tests. The article demonstrates how the tests —which determine some lubricant properties—can help the lubrication engineer in selection of lubricants for specific equipment. Check the coupon for your free copy.

NEW PRODUCT NEWS

Chemical grinding coolant leaves no oily film—keeps machines cleaner. Helps prevent heat check, permits the use of a finer grit wheel—*Cooltex.*

Selection of cutting or grinding fluids can be critical production problem

Which is best—a straight cutting oil, a soluble oil emulsion, or a chemical coolant? Picking the right type is often a difficult problem, yet the correct choice can often yield major production savings, according to Texaco's chief Metalworking Engineer.

Multitude of factors complicate job

It is pointed out that there is no "best" type of fluid—it all depends on the type of operation. Some cutting jobs, for example, can get by with just a coolant, others—such as automatic screw machines—need a fluid that can lubricate as well as cool, because of inevitable leakage between sumps. Physical properties of the work, high heat—even hard water—can also affect the choice.

Grinding: New chemical coolant adds to choice

Chemical coolants—like Texaco's Cooltex, for example, are comparative newcomers to the grinding operation. However, many operators can point to production boosts of over 200% by using Cooltex instead of an oil. But again it all depends on the particular problems of the operation.

Expert advice can save money

Also underlined is the fact that calling in an expert to discuss cutting oil requirements can pay off for a great many manufacturers. Texaco, for example, maintains a staff of Metalworking Lubricant Engineers from coast to coast, whose prime function is consultation on cutting oil problems.

TEXACO INC., 135 East 42nd Street, New York 17, N. Y., Dept. IA-LN-31

Dear Sirs:
Please send me more information on

- ☐ Thermatex
- ☐ Cooltex
- ☐ Recommendations for oil mist lubricants
- ☐ Please send the October issue of Lubrication Magazine

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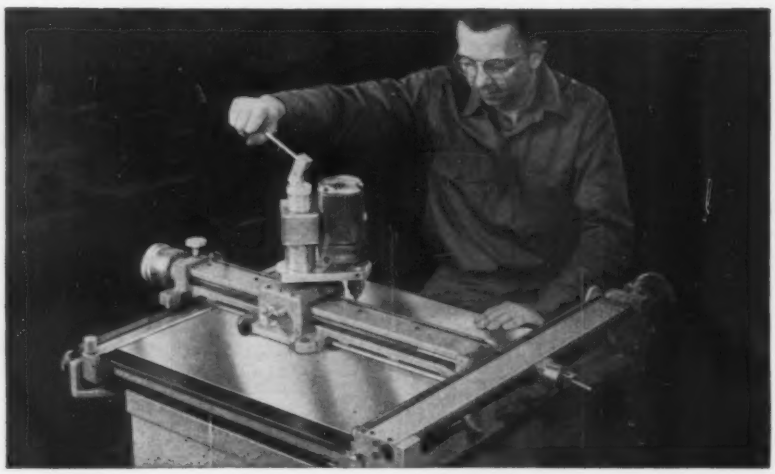

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- **EASY, ACCURATE POSITIONING**—quickly set to any reference point and to nearest 0.100" by adjustable steel tapes reading in both directions from zero. Micrometric gauges then bring settings to nearest 0.001". No optical scanning device needed.
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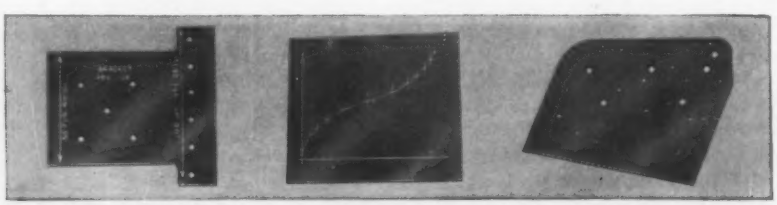
- **¼" CAPACITY** in mild steel — stock up to 24" width, any length.
- **ALSO A PROVEN MONEY-SAVER** on pilot runs, low unit production.



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(Continued from P. 100)

Midland - Ross Corp., Owosso Div.—**R. M. Giroux,** appointed Midwestern regional manager.

E. P. Heiles, appointed vice president, Midland-Ross Corp.

J. R. Becker, appointed general service manager, Brush Instruments Div., Clevite Corp., Cleveland.

Wilton Tool Mfg. Co., Inc.—**E. D. James,** named regional manager, Philadelphia and metropolitan New York sales territories.

Empire Steel Corp.—**H. W. Vinson,** promoted to sales manager, Denver, Colo.

OBITUARIES

C. R. Harbaugh, secretary and treasurer, The Atlas Bolt & Screw Co., The Atlas Car & Mfg. Co., Cleveland.

H. L. McGregor, chairman of the board, National Twist Drill & Tool Co.

DEAD FLAT ALUMINUM STRIP... UP TO 150,000 POUNDS DAILY— ON VOSS ROLLER LEVELERS

(... and no down time in 2½ years!)

One of two Voss Levelers in operation at the Lancaster, Pa., plant of Quaker State Metals Co.

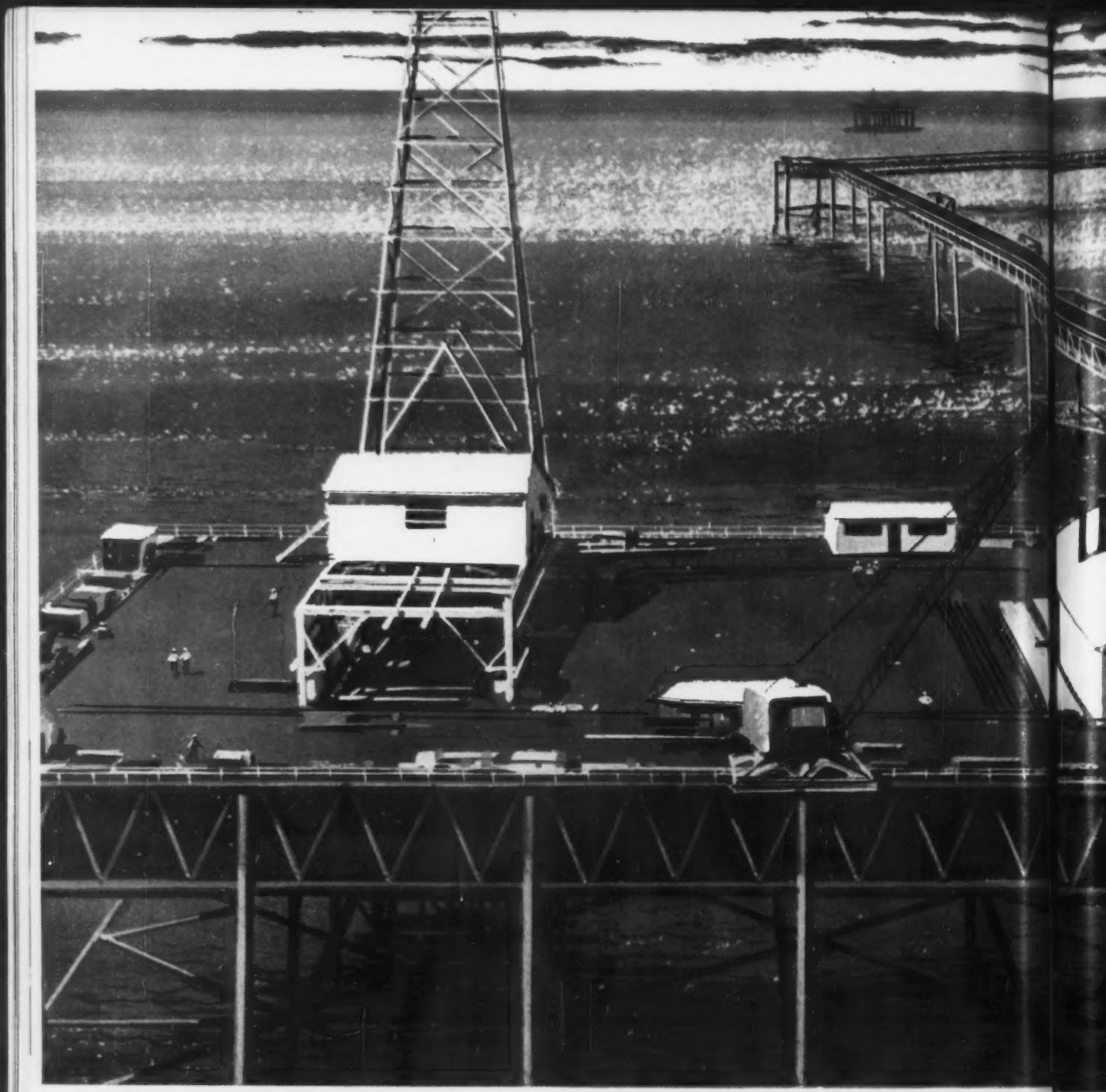
Ask Quaker State Metals Company, a leading supplier of aluminum to siding manufacturers. Quaker State puts *all* their aluminum siding stock through Voss Levelers, because *only Voss gives them the absolute flatness their customers demand.*

Quaker State's first Voss Leveler was installed 2½ years ago, the second one a year later. Both have withstood long periods of 24-hour operation, leveling up to 75,000 lbs. per machine daily . . . with no downtime since installation!

Voss Levelers will solve almost any leveling problem . . . *at high production speeds.* Patented features make possible accuracy and flatness unheard of with any other leveler, *equalling or exceeding stretcher-level flatness in* many cases. Voss Levelers are now in use in steel, aluminum and other non-ferrous plants, in applications ranging from heavy plate to cold-rolled strip, galvanizing lines, aluminum sheets and many others. Let Voss put its years of experience to work for you. Call or Write today.

Voss ENGINEERING CO.

7301 Penn Ave. Pittsburgh 8, Pa. Churchill 2-4422



Biggest man-built island

SEVEN miles off the coast of Louisiana, reaching 220 feet below and rising 60 feet above the Gulf of Mexico, is a massive steel island. It's the world's first offshore sulphur mining plant.

This mine is a project of the Freeport Sulphur Company, and is scheduled to open in 1960. Known as the *Grand Isle*, it will be one of the world's largest sulphur mining operations. The Frasch process will be used. Every day, 5 million gallons of sea water, heated to 325°F., will be injected into the underground sulphur deposit. Hot water melts it. Compressed air will force the liquid sulphur to the surface.

The Gulf of Mexico brews black storms. Vicious storms. But this mile-long structure is built to take the brutal pun-

ishment of the sea. From end-to-end, it's braced with tons of heavy-wall pipe from National Tube.

National Tube is also supplying casing, line pipe and standard pipe for the completion of this project. For more than 80 years, National Tube has handled tough tubular installations in the fields of line pipe, marine piping, mechanical tubing and oil country tubular products. Write us for assistance. National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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National Tube Division of United States Steel

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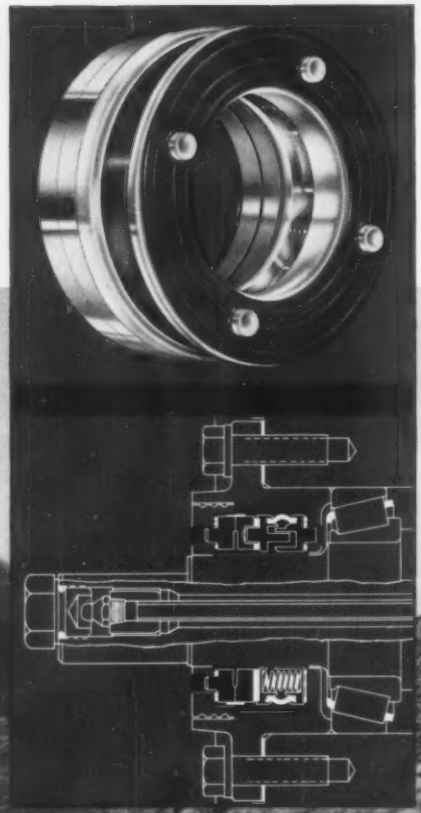
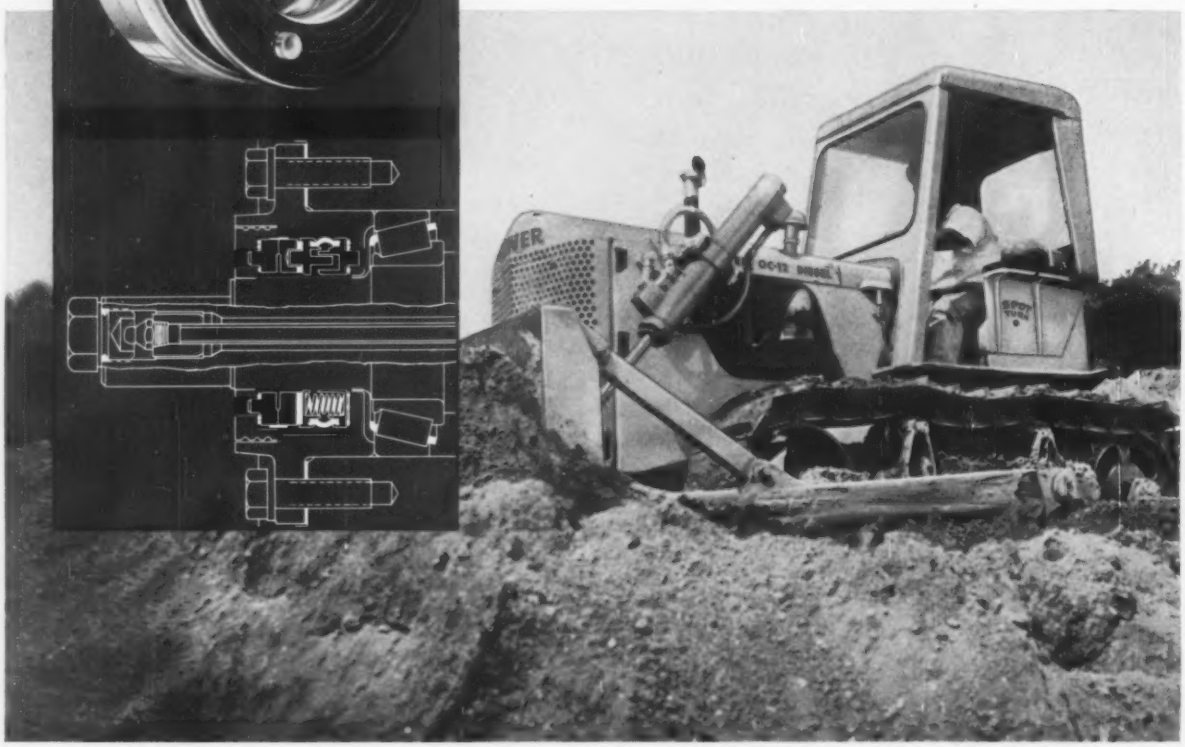
Belly-deep in abrasives!





But it can't touch her track wheel bearings

Whatever the Oliver OC-12 is bulling through . . . liquid ooze, dirt, or gale-blown desert sand . . . nothing can get into the track wheel bearings. Oliver engineers saw to that. They specified C/R Type VS End Face Seals with metal-to-metal contact to protect those bearings. The metal faces in these seals are lapped to within 3 lightbands of being optically flat. Nothing can get in . . . and the fluid lubricant inside can't get out . . . no matter how rugged the duty. Oil seal dependability like this means fewer lube checks, fewer lube changes . . . less downtime. And *that* means big savings for Oliver users.

C/R End Face Seals are performing hundreds of other critical sealing jobs . . . saving equipment, time and money. No matter what is involved . . . high speed, temperature, pressure . . . in everything from rockets and missiles to pumps, tools and washing machines . . . there's a C/R End Face Seal for the job. If it's *your* job to solve a difficult lubricant retention problem . . . share it with us. Write for detailed information on C/R End Face Seals.

More automobiles, farm and industrial machines rely on C/R Oil Seals than on any similar sealing device.

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Export Sales: Geon International Corp., Great Neck, New York

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C/R

Four Ways to Spur Production On Your Present Plant Site

By J. R. Walley—Consultant, Walley & Associates, Dayton

A proven four-way system should help every company meet the heavy demands of the coming metalworking boom.

Do it without adding floor space to your present plant.

▪ Floor space will become critical this year. Base this idea on economics. Experts predict that we are entering into a boom that can last from 12 to 20 months.

This forecast is founded upon the length of business upswings during the past century.

Back orders are already beginning to accumulate at a fast rate. And it won't be long before management will be faced with a big decision. To keep up with demand, it will either have to get more production out of the same floor space or expand physically.

Output isn't solely dependent on floor space. However, some companies can double or even triple employee output over their competitors. The companies who achieve greatest output have four main traits. These traits are really techniques used to gain this high output.

Four Traits—The first technique is a working methods improvement program. The second one is a smooth flowing plant layout. An effective wage incentive plan for the work force is the third technique.

The fourth area consists of a broad incentive plan. It's designed to enlist supervisory personnel in the continuing battle against costs and low production rates.

A working methods improvement program can bring about a quick boost in output. It involves a study of many individual work operations and processes. And it's been proved time and time again that simple, inexpensive method improvements can increase production manifold.

It Takes Time—You can't get continuing results from such a program on a one-shot basis. For best results, the program should require that foremen be given sound training on ways to improve methods. There are many excellent courses available.

However, each training program must contain certain basic principles which the foreman can apply to any department or operation. The training program must start by showing the foremen how to go about selecting the job to be improved.

They must know how to handle it and which procedure to follow. After successfully working out an improved scheme, they must also know how to sell it and keep it sold.

Help If You Need It—Generally, it's best to develop a training program to meet situations within a given company. Many consultants and university professors are available to develop and present such programs.

Another trait of companies hav-

Some of the Areas Studied

SIC Group	Product Manufactured	Space per Employee, sq ft
20	Food and Kindred	566
23	Apparel and Related	258
24	Lumber & Wood (except furniture)	892
25	Furniture and Fixtures	756
27	Printing and Publishing	474
28	Chemicals and Allied	428
30	Rubber	234
32	Stone, Clay and Glass	539
34	Fabricated Metal	600
35	Machinery (not Electrical)	333
36	Electrical Machinery	618
37	Transportation Equipment	490
39	Miscellaneous Industries	227

ing high employee production per square foot of floor space is a well planned, smooth flowing plant layout.

All too often, the manufacturing plant just grows. New products are developed. New equipment is installed. New operations are required.

But two things result from such action. One is high costs. And the other is low productivity.

Voice of Experience—One company president believes that material must keep moving and remain off the floor. This man heads an electric motor manufacturing company with a fine earnings record.

In following this policy, his company continues to give constant attention to plant layout. As a result, it now leads its industry in low cost, high production.

Any attempt to increase productivity within a given amount of floor space can only succeed if there's an efficient plant layout. This helps in several ways. For one, it reduces the amount of material handling. The direct result is a saving in labor.

It also speeds travel time through the plant. This gives higher production with lower inventory and work in process. Finally, such a setup leads to more convenient, less crowded working areas. That means workers can perform their jobs in as little time as possible.

No Substitute for Planning—Successful plant layout work requires exacting, careful study of details. It demands skill in presenting alternative layouts. Then, too, ability is required in order to effect prompt decisions from management when they are needed.

There are times in plant layout work when it's best that qualified outside personnel be assigned to head up the project. They have the time to work out details and to study alternative layouts. And they can sit in the driver's seat at the many meetings needed to get all principals in agreement on the most practical layout.

Less Handling—High output in a small amount of floor space can only be achieved by reducing handling to a minimum. Travel time must also be shortened. And working areas must allow enough room for employees to work in. A well planned floor layout can bring out these benefits.

The third trait of a company achieving high output is the successful use of a wage incentive plan. A manufacturer using wage incentives often produces double the amount of units a similar company produces without incentives.

Industrial engineers taking time studies in plants where wage incentives are not in use seldom find an employee working at more than 65 pct of output. So measured daywork is a weak system.

How to Improve Training

1—Select the Job

Supervisors always have difficulty in selecting a job to improve and so training is given in this important phase at the beginning of the instruction program.

2—Look at the Present Method

Many foremen want to start working on an improved method without knowing the present way a job is done, and therefore training is given in how to analyze work being done.

3—Which Tool Should Be Used?

There are many fine tools available for improving methods. Foremen must know which tool to use under varying circumstances in order to achieve best results.

4—Ask "W" Questions

Foremen are taught how to use the "W" questions—who, what, why, when and where—so that no important details of the job being studied are overlooked.

5—Develop the New Method

A new method results from careful analysis of present procedure, elimination of unnecessary work, and imagination in combining and rearranging the necessary work.

6—Evaluate Benefits and Get Approvals

Before putting a proposed method into effect, it should be carefully evaluated from a cost, savings, safety and productivity viewpoint. Also write an adequate proposal to get approvals as needed.

7—Put the New Method Into Effect

Resistance to new ideas is strong at times and foremen need special training in this area so that their improved methods will be accepted enthusiastically.

8—Keep the Method Sold

Sometimes the work force will accept a new method but not give it a good trial. So foremen must be given help in techniques of worker relationships.

Why Bother? — There's nothing in such a system to make the employee produce more than he wants. In fact, the men who use time studies for measured day-work systems ask about 20 pct less work per hour than plants using wage incentive programs.

Productivity expected through wage incentives is usually 30 pct of a normal day's work, as measured by time study conducted by qualified industrial engineers.

In 1945 the War Labor Board noted that some companies reflected a 40 pct jump in output within 90 days after hastily-conceived incentive plans had been installed. At the same time WLB stated that plans based on time study had the best chance to succeed in boosting production.

It All Depends on Planning— Some incentive plans cut costs and increase output. Others don't. Here are a few tips on ways to avoid some of the pitfalls in installing such plans.

First, use time study to set up production standards. If possible, set each worker up in business for himself. Give him individual standards. Make the incentive reward appeal to the worker.

Provide a procedure for employees to follow it they don't agree with the production standard. Set up controls to measure performance. Let management know the weak and strong production areas. When the need arises to change methods, be sure you change performance standards, too.

Remember the Foreman — No worker plays a more important role in the overall plan than the foreman. Keep him informed about management plans. But hold him responsible for results.

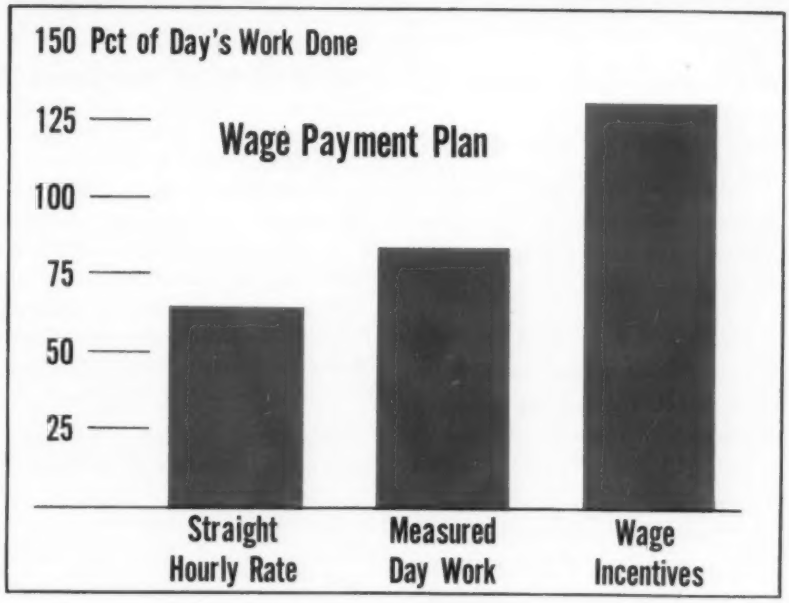
But no foreman will side with management unless you establish an incentive plan for supervisory personnel. A good bonus plan for foremen can result in increased output at much lower cost.

The one foreman's plan that works best for the company is called a "variable budget over costs" plan. It's a favorite among foremen, too. In this plan, the controlling factor is the standard hours produced.

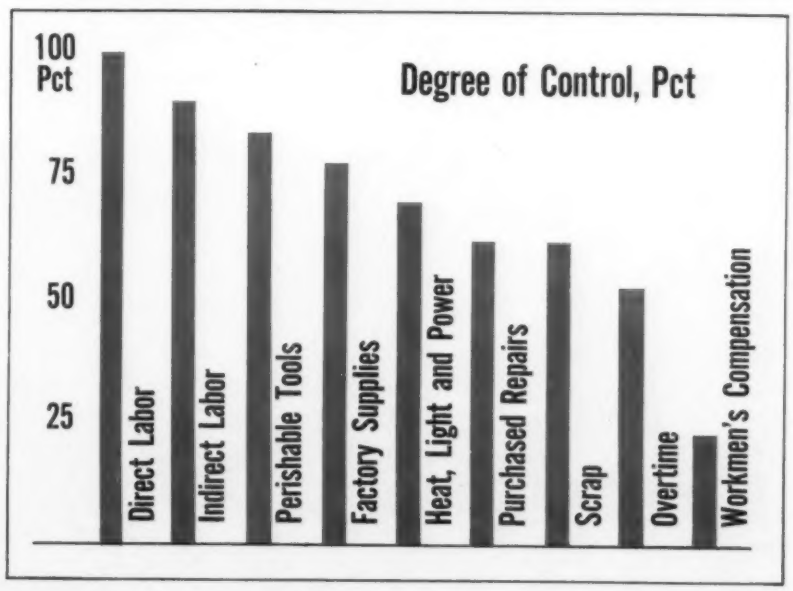
He's Right There—It should include variable cost standards over all manufacturing expenses which a foreman exercises some degree of control.

The best way to get more from the same floor space is to make better use of your present facilities. To reach this goal, follow the four proven methods outlined above. Many of the leading plants in industry today are doing just this.

Wage Plans Make a Difference



Give Foremen Some Control



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Adhesive-Bonds Form Magnets

Use Rubber-Base Phenolic Resin to Join 420,000 Laminations

Adhesive-bonding process fashions 475 tons of steel into magnet cores for a huge electron accelerator.

Cores are built up from 420,000 laminations, insulated from each other by the rubber-base adhesive.

▪ Adhesive-bonds shape magnet cores out of 475 tons of steel. The entire job involves 420,000 laminations, each less than 0.015 in. thick.

A bonding process, developed by the Eddystone Div. of Baldwin-Lima-Hamilton Corp., Philadelphia, turns out 30 cores per week on a block-long production line. The massive electron accelerator, under construction at Harvard University, will require 612 of these magnet cores. The cores form the heart of controlled "electron orbit" system.

Shop personnel handle laminations with white surgical gloves as they pass through critical points of the adhesive-bonding process.

Here's How—A rubber-base phenolic resin, a product of the Rubber & Asbestos Co., Bloomfield, N. J., is the bonding medium. Mr. P. D. Peltier, head of the team that developed the process, states: ". . . A rubber-base adhesive will hold the steel sheets together without mechanical bonds of any kind. At the same time the rubber-base adhesive creates fewer production problems on this particular job than one of the new epoxy resins."

A 450-ton Hamilton press, equipped with a special carbide die, forms the pole tips. Two-step punching operations handle each lamination separately. First, the die cuts a key-hole opening so that the thin sheet won't curl. Then, the other half of the die cuts the final pole tip. Half of the laminations are cut with an open throat, half with a closed throat.

The stream of electrons, accelerated by the completed machine, passes through these openings. Pole tip gap widths, held within 0.002 in., insure that the electrons follow a prescribed orbit.

Clean Work—Chemical degreasing in a tank removes all foreign matter. An automatic timing and

SHUFFLED LAMINATIONS: Steel sheets, after shuffling operation, are ready for conversion into 612 magnet cores. Cores form heart of controlled orbit system for electron accelerator.

electrical transfer mechanism insures uniform chemical treatment of the laminations. After the steel laminations are degreased, handling is done with surgical gloves, until a gas fired oven cures the bonded cores.

Roller coating operations apply carefully measured amounts of the rubber-base phenolic resin to both sides of each lamination. Care is taken in handling to prevent bending or twisting the steel sheets out of shape during these operations.

Conveyor-Fed Oven — Infra red lamps, in a conveyor-fed oven, precure the adhesive-coated laminations. Exhaust fans remove fumes from the adhesive's volatile solvent. The conveyor-fed oven is 90 ft long and moves the laminations at speeds up to 25 fpm.

A special fixture insures perfect alignment during stacking operations. Alignment of the sheets is within 0.001 in. across the 10.5 in. thickness of each core. Greater variations in alignment cause electrons to be lost before full acceleration is reached. A heavy-duty pneumatic wrench, with a distinctive bearing plate, closes the fixture.

Oven-Curing — An automatically controlled oven handles final curing of the bonding adhesive. The bonded cores move on a roller conveyor in groups of three or more, into the large walk-in oven. There, baking takes place at about 400°F for several hours. Thermocouples attached to the cores indicate the curing temperature on instruments outside the oven. They turn the heat off when cores are finished.

Cleaning excess bonding resin from pole tips and reference surfaces is a painstaking hand operation. A common paint remover, found on the shelf of a local hardware store, solves the problem.

Check-Out — Inspection of completed cores requires accurate measurement of dimensions, checking of weights to determine the lamination factor, and delicate electrical measurements to check the electromagnetic properties of the finished cores.

The lamination factor is the ratio of the weight of the finished core to the weight of a solid piece of steel. Lamination factors are held within 92 to 93 pct. In other words, although made of thin laminations glued together, the cores approach being a solid steel.

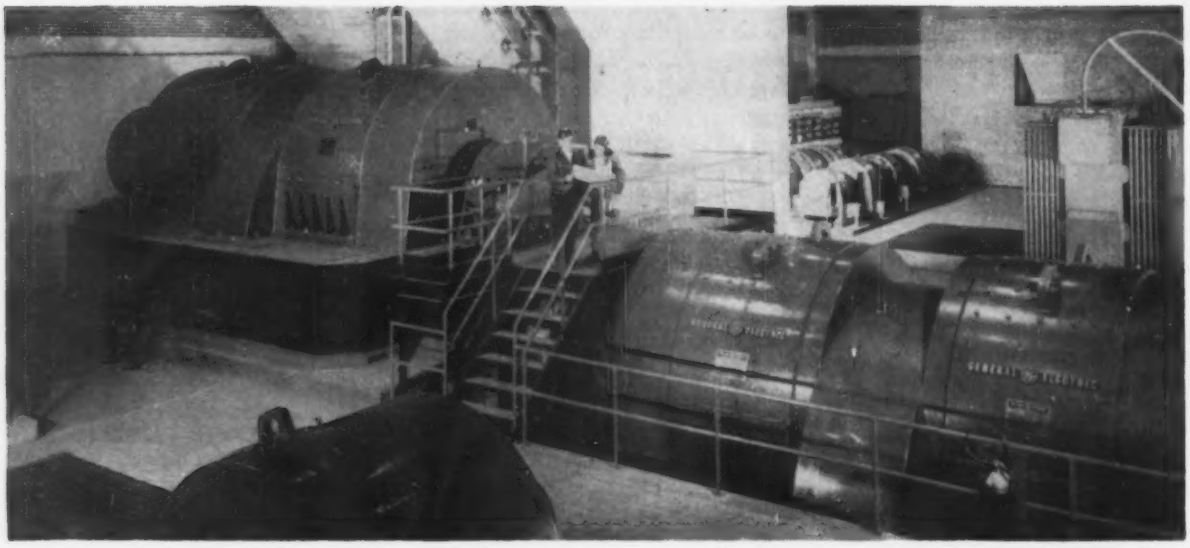
Electrical checks confirm that the rubber-base adhesive insulates all laminations from each other.

A Shuffled Deck—At the start of production, all steel sheets that go into the cores, are systematically shuffled. This insures that each core is magnetically identical with every other core in the accelerator.

The same grade of steel (Armco Tran-Cor oriented silicon steel, thermally flattened and coated with Carlite) goes into all laminations. However, the large quantity of steel had to be made at the mills in several heats. Systematic mixing eliminates all variations in the magnetic properties of the steel.

PRECISION ONE-TWO PUNCH: Hydraulic press forms pole faces. Laminations are handled separately.

COATING LAMINATIONS: A film of rubber-base phenolic resin is applied to both faces of lamination.



IN OPERATION: Design of the twin-drive arrangement of motors enables maintenance crew to work quickly.

Check Reversing Mill Downtime

Twin-Drive Motor Design Solves Maintenance Problems

Design engineers are beginning to realize that production is counting on them in more ways than one.

For equipment to run properly isn't enough. Sensible construction is a convenient safeguard against unscheduled downtime.

▪ The main driver for heavy-duty reversing mills is the twin-drive motor. Naturally, it's vital that this motor operates at peak efficiency for the sake of production.

But most drive setups simply discourage easy maintenance. Why? Because the lower motor is often buried under the extension shaft.

As one mill foreman aptly put it, "We'll lose two turns removing the extension shaft, and later replacing it over the frame of the lower motor."

Get Practical — Did this make sense? Not to the engineers at General Electric Co., Large Motor & Generator Dept., Schenectady, N. Y.

So they went into a huddle. The result? A new standard arrangement that places the top motor forward over the extension shaft of the lower motor.

There was no valid reason for the shaft to be on top. Proof lies in the fact that never in the history of GE has any maintenance been required to an extension shaft.

Low Upkeep—Quick service of such motors is now possible. At present, you'll find 13 "Top-Forward" units, as they're called, in operation. That's a total of 115,000 hp churning away within the steel industry.

One of the most deadly drains of profits in steel mills is downtime. But to pin it down even more, nothing is worse than unscheduled downtime. The newly-designed set-up will hold it at bay.

Cranes can now move right into position, having wide-open access to both motors. As unlikely as it seems, if the shaft ever has to be removed for any reason, it can be done without disturbing either motor. You just remove it toward the mill.

Easy as Pie—Access to motor bearings is simple too. Thrust bearings, the ones subjected to heavier duty, are located where the motor room crane can reach them in a direct lift of the pedestal cap or bearing parts.

You can also reach the guide bearing for the extension shaft easily. There's a port in the side of the base of the upper motor for this purpose. A low head-room crane above the port gets at the guide bearing cap and bearing elements.

The motor air shields are also accessible for straight lifts. Before, these shields were bolted to the motor frame and base. And it took hours to remove them.

No More Bolts—But there are no

bolts on the new cover. Tapered locating pins, attached to the motor frame, position the cover as it's lowered into place on the base.

There are few air leaks. But contaminated air can't enter the machine. The tight contact needed to provide these features is supplied by gasketed neoprene-rubber joints on all steel edges of the shield. Now it only takes about five minutes to remove and put back the cover.

Forged-flanged couplings on the motor armatures and extension shaft furnish a practical arrangement to the new setup. First of all, the new coupling is much stronger than couplings of cast steel.

Why They Broke Down—Failures of cast steel couplings have occurred in reversing hot-mill motors. They were caused by the inherent stress level of the couplings combined with a low ductile material throughout.

Forged flanges on the motor side insure better fits for the face key of the universal coupling. There's enough friction introduced by the coupling bolts to carry at least the circuit breaker torque of the drive.

A male key becomes an integral part of the universal coupling. Close-tolerance machining of the female keyway provides the intimate contact needed.

Not as Long—Forged-flange couplings are shorter too. The smaller size reduces the motor inertia of the twin-drive by 2 to 4 pct. This adds just that much more torque to rolling operations.

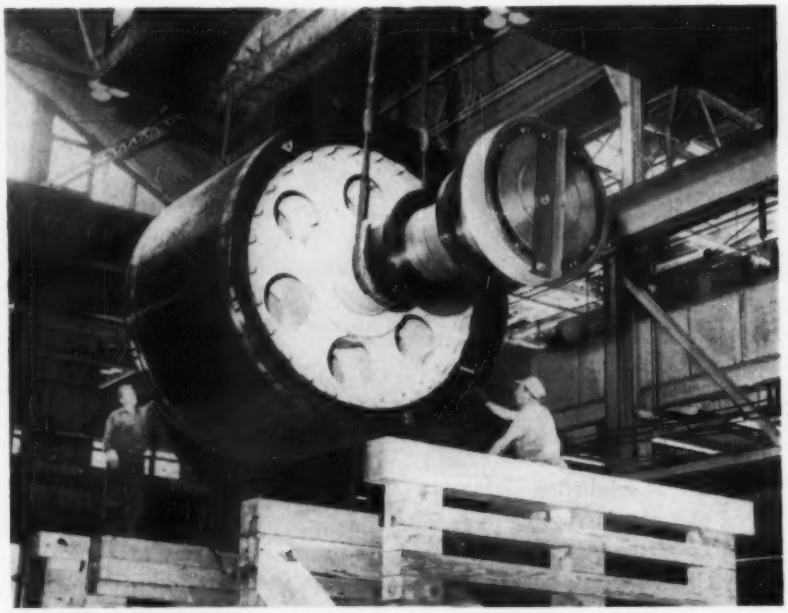
The new twin-drive setup is built better mechanically. As a result, it resists shock from the mill. The bottom roll of a hot mill receives more torsional shocks than the top roll. The more rigid bottom-roll bearing support contains ingot chatter and roll slippages.

New Pattern—But the "Top-Forward" motor makes use of a motor spindle in series with the lower motor's mill spindle. Therefore, the elasticity between the bottom roll and lower motor is just about doubled.

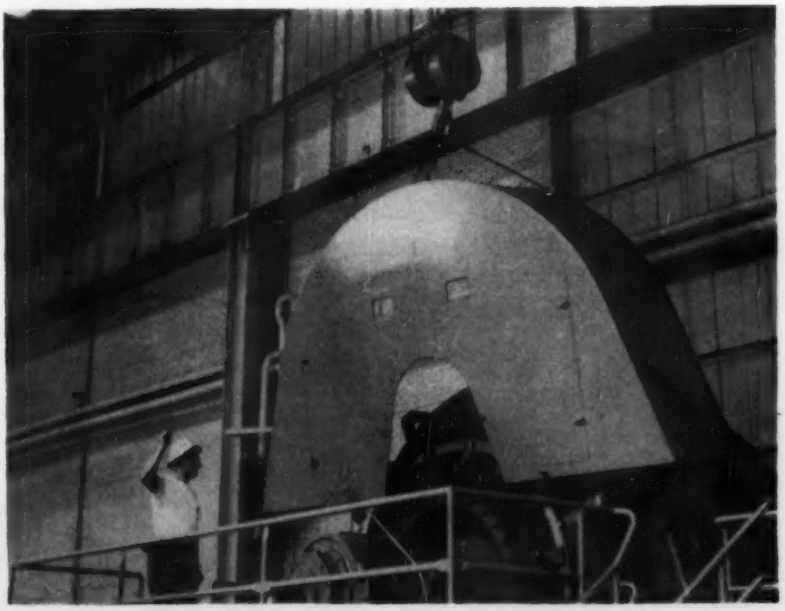
This cuts down on the higher torsional shocks of the lower roll. And it's done by the more flexible setup to the attached motor.

The twin-drives answer a demand from industry. Simply, it concerns increased production at lower costs. A new machine design handles the problem. Think how similar problems could be solved the same way —through changes in design.

And, thanks to design, reversing mills have come a long way from the water wheels that used to roll plate for the iron-clad ships of the Civil War.



MODERN DESIGN: New forged flange on motor shaft and both ends of extension shaft permit integral design of coupling, reducing overall motor length. Upper and lower motors are interchangeable.



AS A COVER SHOULD BE: It's no problem lifting the new quick-removable covers. They are standard equipment on all twin-drive motors.

Are Stress-Relieved Castings Worth the Extra Cost?

By E. W. P. Smith—Metallurgical Engineer, Bendix-Westinghouse A. A. B. Co., Elyria, O.

Practice for over 25 years has been to stress-relieve certain iron castings.

Stress analysis tells us how well this treatment works with complex parts.

▪ Foundry men have recognized residual stresses in cast iron for many years; their effect is evident in distortion and cracking of castings.

These residual stresses are caused by differential solidifying and cooling of the metal. As the molten metal cools, the outer layers are usually the first to solidify and contract.

As the metal continues to cool, the already solidified metal opposes further contraction; this introduces residual stresses—obviously affected by foundry practice, iron type and part design.

"Aging" Takes Too Long — Practice, years ago, was to "age" castings in the storage yard. But with mass production, the long time "age" was not feasible; it requires a large inventory and much storage space. "Aging" in the storage yard is simply stress-relieving at ambient temperatures; and at these relatively low temperatures, it takes many months to do the job.

About 25 years ago, this technique was replaced by a controlled stress-relief heat-treatment. This accomplishes in hours what used to take a year in the storage yard.

Stress relieving does not alter physical properties; it does not soften the iron, or reduce its strength or wearing properties.

Reduces Stresses—It is a below-critical heat-treatment that reduces the "locked-in," as-cast stresses. And this treatment has not changed much in the past 25 years.

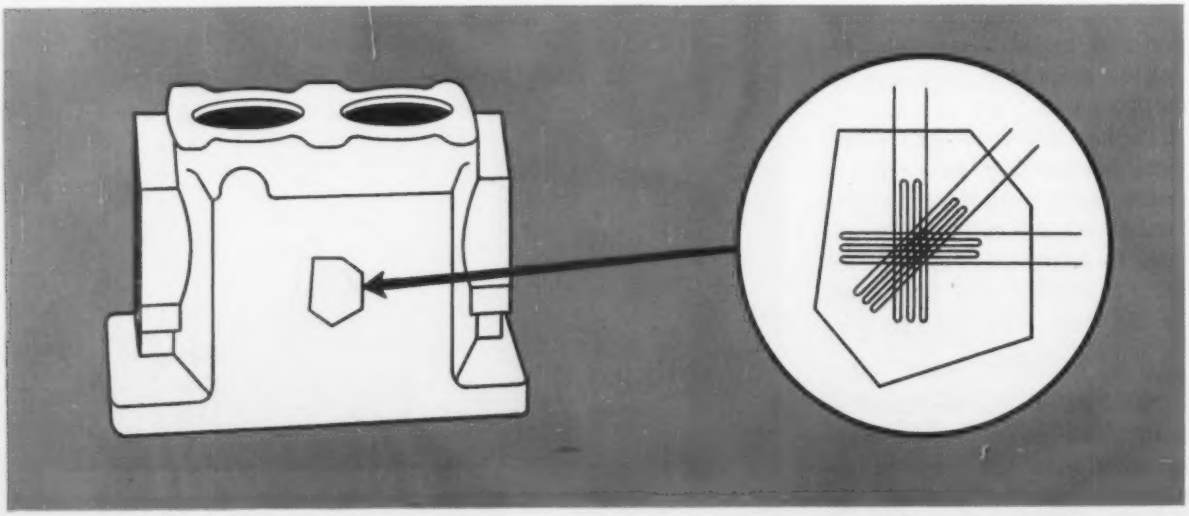
People who use stress-relieving are aware of its practical value. They know that without stress-relief, castings distort so that satisfactory assemblies cannot be made.

Bendix-Westinghouse wanted to know what it was getting for its stress-relieving dollar. How well does the heat treatment relieve the stresses in an as-cast structure? Is the stress-relieving worth the added expense?

Use Sensitive Gages — Stress analysis gives the answers. This method uses very sensitive gages to measure the strain in the castings. These strain gages are so sensitive, they will measure how much you can bend a 1-in. iron bar with your bare hands.

They work on the principle that

Group Strain Gages in Rosette



GIVES DIRECTION: Rosette arrangement of strain gages gives direction as well as magnitude of stress.

MEASURES STRAIN: Small piece of crankcase with rosette attached is all that remains after cutting away of metal. After each metal removal step, indicator measures strain in microinches per inch.

as a wire stetches, its cross-section decreases and therefore its electrical resistance increases. The wire strain gages are cemented to the material upon which stress measurements are to be made. As the material is stressed, both it and the gage compress or elongate depending upon the type of stress.

Compression or elongation causes the gage to change resistance in proportion to the strain. This allows us to measure the strain and —since strain is proportional to stress—the stress.

Need Complex Casting—Preliminary tests showed that a simple casting would not work; it does not have the "locked-in" stress as do complex production castings such as compressor crankcases.

A crankcase has both thick and thin sections; it also has an area which allows the easy placement of SR-4 gages, thus reducing chances of experimental error.

The foundry provided crankcases in the stress-relieved and as-cast condition. The as-cast crankcases were cooled in the mold 3-5 hr before shakeout. The stress-relieved castings were heated to 1100°F, held there for ½ hour slow furnace-cooled to 600°F, then air-cooled.

Gives Direction Also — SR-4 gages were applied to the side of each crankcase in a rosette arrangement. This is necessary because the direction of the stresses is not known; and this arrangement will give direction as well as the stress magnitude.

One technique of stress analysis calls for the cutting away of portions of the casting. Any residual stresses in the metal are released when the metal is cut away. The section that is left assumes a "free state"; it is no longer restricted by the surrounding metal.

Strain gage measurements are made before and after cutting portions away. They reflect any change in dimensions in the remaining test section. These results are directly related to the "cast-in" or residual stresses.

Test Section Remains — Technical personnel at Bendix-Westinghouse used this procedure on both the as-cast and stress-relieved castings. They cut the castings at the mold parting line. Taking care not to generate too much heat, they then milled metal away until only a small piece of casting—with the gage cemented to it—remained.

After each cutting step, strain gage readings were taken with a Baldwin Type-L strain indicator. There is a channel selector switch which permits the taking of readings from all three gages in the rosette.

Standard stress analysis calculations were made to convert strain to stress. These converted readings show that the crankcase in the as-cast condition has a residual stress of 16,000 psi; in the stress-relieved condition, it has a residual stress of 1500 psi. This represents a stress reduction of about 90 pct.

It is ample proof for Bendix-Westinghouse that it is getting value for its stress relieving dollar.

Color Match Production Parts

Are you putting together previously painted parts or shipping colored sub-assemblies?

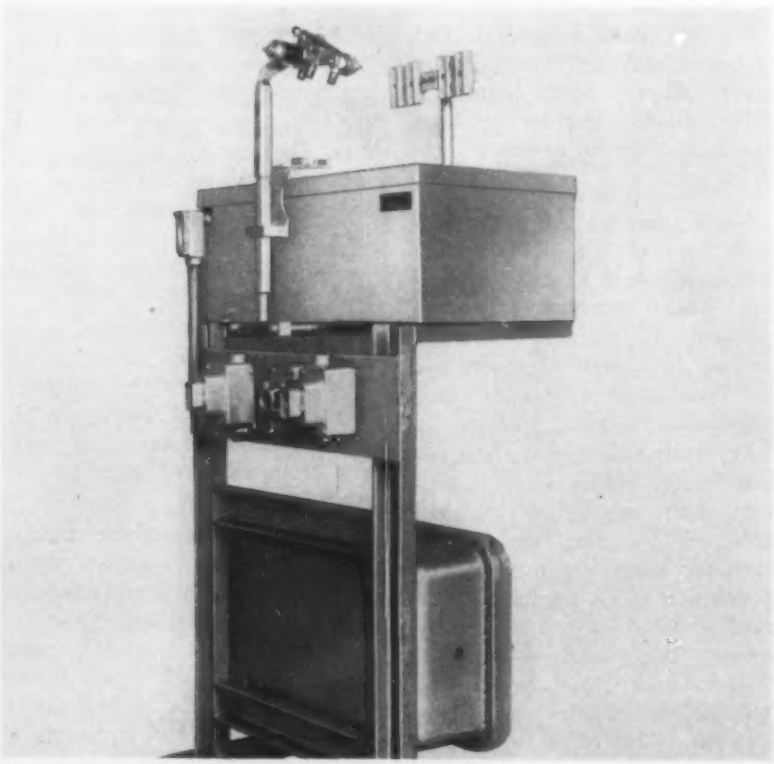
If so, this test sprayer overcomes guesswork — and costly errors — resulting from imperfect color matching.

▪ Mass production of quite a few items requires perfect color blending of pre-painted components at assembly. Color matching problems were increased by the public's demand for delicate pastels and tricky polychromatic finishes.

Using the automobile as an example: the body is painted in one part of the factory. It then swings on an overhead monorail to the "body drop" point. There it joins the chassis. About forty ft down the line the front-end assembly, including the fenders, is mounted. Later the hood is set in place. Each part, painted in a different section of the plant—or even in plants at different locations—must match when assembled.

Guesswork Eliminated—The old method of color matching and testing by hand spraying is inadequate for the new colors and finishes. Human variations in traversing (spray) speed, along with a variable distance from, and angle to, the test panel, produce dissimilar test results.

This problem led to the development of a practical test panel sprayer which eliminates all human errors in application of reproducible finishes for matching and testing. A product of the Eclipse Air Brush Co., Newark, N. J., this apparatus is being used by many paint manufacturers and producers of painted sub-assemblies.



AUTOMATIC PANEL SPRAYER: This unit simulates production spray painting procedures. An electrical time cycle control is provided to adjust the number of spray passes and the rest periods between.

Explosion Proof—Three models are available. The newest is electrically operated with automatic controls timing the number of spray passes and the rest periods between spray coats. This unit simulates actual production procedures in operations such as automobile painting. A standard electrical unit, without the automatic feature, is available. And an air operated panel sprayer, with a built-in tachometer to provide repeatability, is also offered. All units are explosion proof.

Suction cups or a magnetic bracket secure the test panel in place. Panel sizes range from 3 by 5 in. to 12 by 14 in. Panel carrier speeds, in inches per minute, are read directly from the tachometer on the air-activated model. Electric units are provided with various change-gear combinations.

The distance from the fixed spray gun to the reciprocating panel is adjustable from 6 to 18 in.

Standard Spray Gun — Any standard hand spray gun can be locked to the unit. Vertical adjustment of the gun, from 6 in. to either side of the panel centerline, is easily effected. In addition, an adjustable attachment is provided to permit lapping two sprayed swaths on one test panel.

The test panel sprayer was designed primarily to permit duplication in coating applications. However, the unit nearly parallels hand spray procedure—the results being practically identical, according to the manufacturer—and generally simulates automatic operation exactly. An alternate use is production of accurate film thicknesses for exposure, salt spray and chemical tests.

NOTCHES SAWS: Operator positions blank on spindle of rotating fixture; the notcher does the rest.

Make Saw Blades on Notcher

New Use for Notching Machine Is to Stamp Out Teeth Patterns

Long used for electric motors, the notching machine now makes circular saw blades.

Advantages of its use include: simplicity, quickness of operation, safety.

▪ Until recently, notching machines were used mainly to produce laminations for electric motors. But the decision to make rather than to buy circular saw blades has resulted in a new use for these units. It is a good example of how management very often steps over traditional methods and turns to new techniques.

The operating principle of the machine was the big hint. It makes extremely rapid and accurate notching around the periphery of circular steel discs.

Stamps Out Teeth—Production people, at the Black & Decker Manufacturing Co., Towson, Md., saw that it was adaptable to the stamping out of teeth patterns of circular saw blades used on the company's portable electric saws.

The machine doing the job is a standard V & O Notcher made by the Hudson Div. of Emhart Manufacturing Co., Hudson, N. Y. Punch and fixture designs were worked out by Black & Decker engineers in collaboration with Emhart's press tooling specialists.

The advantages of the notching machine for this assignment are these: Simple punches—rather than expensive compound dies — are used; the punches can be quickly removed to meet changes in blade design; blanks are placed in the die bed but on the spindle of a rotating fixture — a safety feature inherent in the method.

Punches Center Hole — Blanks are stamped out at the company's plant in Hampstead, Md. This operation includes punching the center hole. The notching and the heat-treating are done at the main plant in Towson, Md.

In use since the early summer of 1959, the notcher has demonstrated that it is at ease with saw blades. No operational problems have been encountered. Rejects have been minimal.

Management reports that by making their own blades, the company has been able to hold the line on prices to meet competitive pressures while improving product quality. New blades will also be made by the notching method.

Leaded Steels: Apt to Fatigue?

Compare Properties of Leaded and Non-Leaded AISI 4340

Lead improves machinability of steels. But how are other properties affected?

Here's some recent information on what lead does to fatigue limits.

▪ Experience tells us that the addition of lead to steel improves its machinability. These additions usually range from 0.15-0.30 pct.

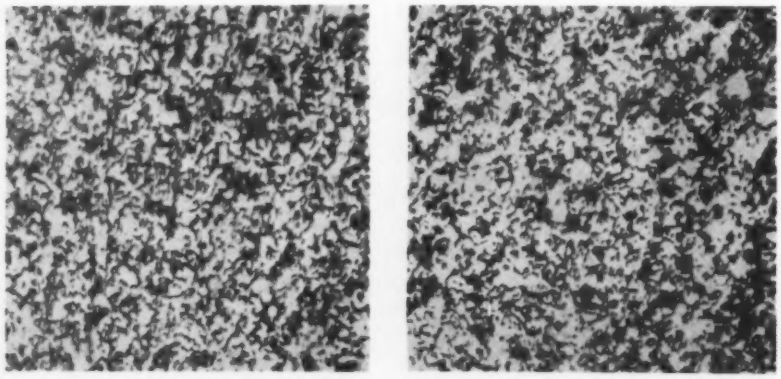
Shops often take advantage of this effect to reduce production costs. But what will the presence of lead do to the mechanical properties? This is an important consideration when you use leaded steels for highly stressed members; certain properties may be critical in design.

Information on those properties measured by tensile, hardness, and impact tests are available. Researchers point out that, at room temperature, lead additions up to 0.30 pct cause little or no falling off of those properties. They also report, however, that some or all of those properties tested at high temperatures, may be affected by lead additions.

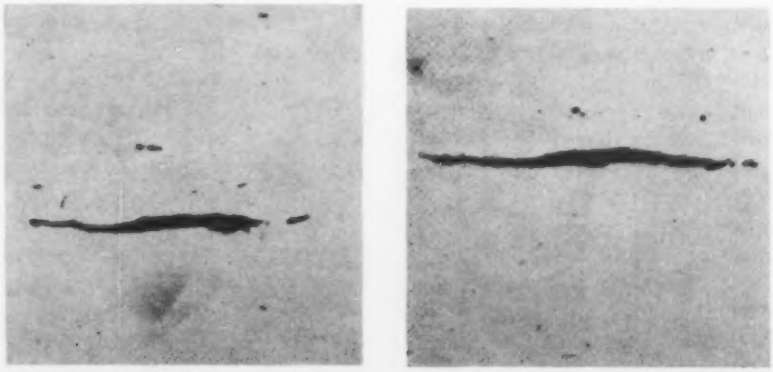
Need Fatigue Data—How about fatigue properties? Some data is available but J. R. Suhre and G. W. Brock of the Dep't of Theoretical and Applied Mechanics, Univ. of Ill., sought more answers.

They are particularly interested in AISI 4340 heat-treated over an extensive hardness range. Their final report is now complete. In it Messrs. Suhre and Brock point out the effect of a variation in lead content on the tensile and fatigue properties of smooth and unnotched specimens.

The results of their study include these findings: Lead additions of 0.17 and 0.25 pct have no significant effect on the tensile strengths and elongation of AISI 4340 steel, heat treated to high hardness values. But these same additions do reduce the mean fatigue limit.



HAS NO EFFECT: Addition of 0.25 pct lead to the sample of AISI 4340 on the right has no noticeable effect on the microstructure. Mag.: 100X.



SAME SIZE: Specimens have different lead contents—0.17 pct on left, 0.25 pct on right. But inclusions are about the same size. Mag.: 100X.

Add Lead to AISI 4340—Material for the investigation was obtained from the Copperweld Steel Co. The company supplied portions of a heat of AISI 4340 steel, leaded to 0.17 pct and 0.25 pct contents together with a non-leaded portion of the same heat. The specimens were machined and heat-treated to the desired range of hardness values for testing.

A metallographic study reveals that the addition of lead has no noticeable effect on the microstructure of the steel. The use of a special etch to expose lead inclusions shows no difference in the inclusion size between the steels containing 0.17 pct and 0.25 pct lead.

The table summarizes the results of the individual stress-strain curves for both leaded—0.17 pct and 0.25 pct—and non-leaded specimens. It shows that all specimens in any particular group have about the same yield strength, tensile strength, and elongation. However, there is a decrease in reduction of area val-

ues for those steels having strengths greater than 186,000 psi.

Cycle Until Failure—Individual S-N curves (plots of the number of cycles to failure at a given stress) were made for a number of specimens at each strength level. A statistical method was used to determine the mean fatigue limit.

The mean fatigue limit refers to the limiting value of stress below which a material can withstand an infinite number of stress cycles.

Testing consists of estimating the mean fatigue limit and testing the first specimen at this stress. If the specimen runs out, the stress is increased one step per specimen tested until a specimen fails. Similarly, if a specimen fails, the stress is lowered step-wise until a run-out occurs.

Consider The Scatter — Since there is scatter in the data, 95 pct confidence limits were calculated. They indicate that 95 pct of the confidence limits computed will include the population mean.

A study of the data shows that lead additions of 0.17 pct and 0.25 pct reduce the mean fatigue limit of AISI 4340 steel. However, there is no apparent difference—in regard to this effect on the fatigue limit—between the 0.17 pct lead addition as compared to the 0.25 pct lead addition.

What about the fatigue life at stresses above the mean fatigue limit? A comparison of the S-N curves indicates that the lead additions have little or no effect at these stresses.

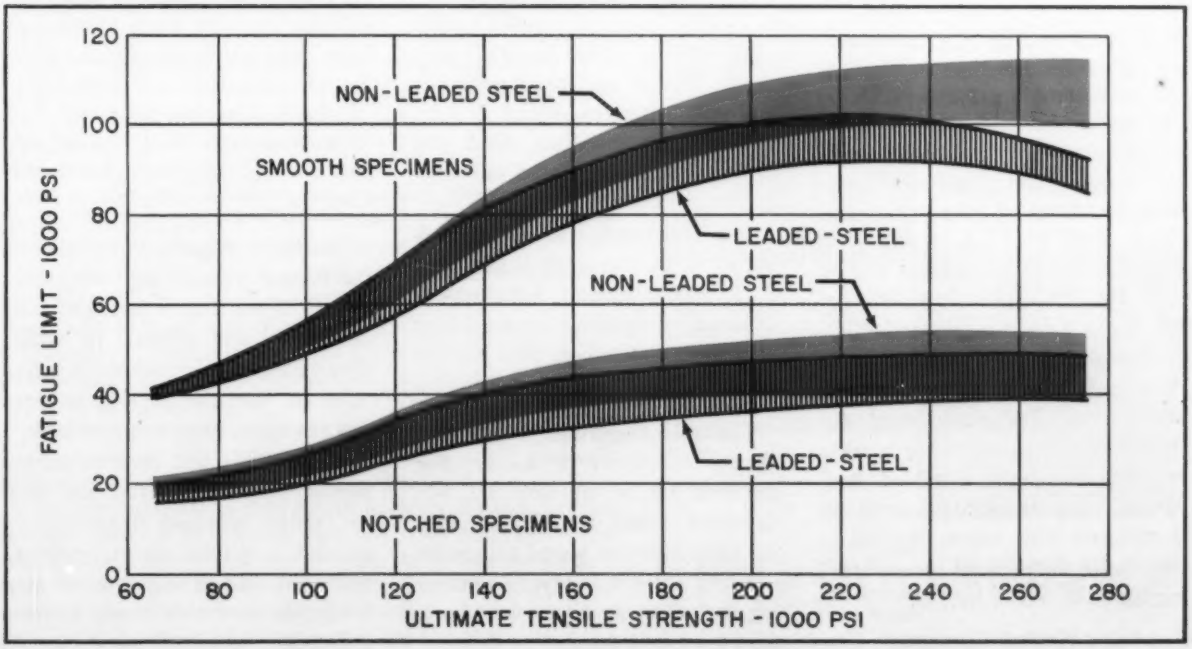
The graph is a summary of the fatigue data; it contains a plot of scatter bands based on the confidence limits in this and previous investigations. The specimen sizes and testing procedures were similar; therefore, the results may be compared on an equal basis.

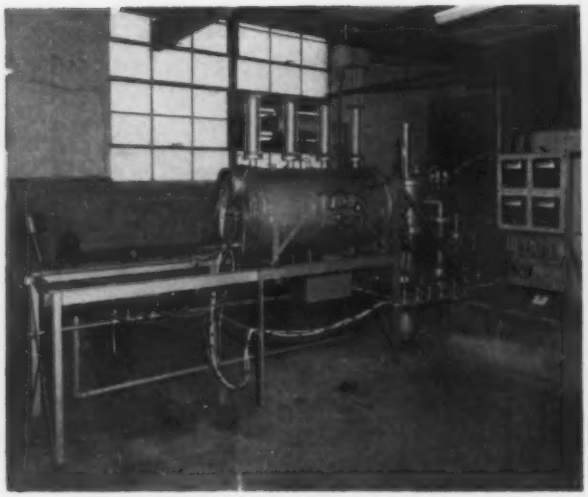
How Lead Affects Properties

TENSILE AND HARDNESS TESTS ON AISI 4340 STEEL

Avg. Lead Content, pct	Tensile Strength, psi	Yield Point 0.01 pct Offset, psi	Reduction of Area, pct	Elongation, pct	Average Hardness
0.0	103,000	64,000	56.0	25.0	89.2 Rb
0.17	102,000	62,500	53.0	28.2	87.0 Rb
0.25	103,000	64,000	54.3	25.8	87.5 Rb
0.0	154,000	148,000	63.0	20.2	31.8 Rc
0.17	153,000	142,000	66.5	19.0	31.4 Rc
0.25	152,000	143,000	62.0	20.0	32.0 Rc
0.0	188,460	163,600	52.7	14.3	41.0 Rc
0.17	183,460	155,300	48.8	14.6	38.4 Rc
0.25	185,730	147,000	46.1	14.3	39.2 Rc
0.0	232,890	183,700	52.8	11.9	46.6 Rc
0.17	228,680	165,000	38.5	9.8	45.8 Rc
0.25	230,410	203,000	39.8	9.6	45.4 Rc
0.0	272,460	168,000	50.0	13.1	51.6 Rc
0.17	266,250	185,000	38.3	11.4	50.6 Rc
0.25	268,040	179,000	39.6	11.9	50.8 Rc

Lead Reduces Fatigue Limit





BRAZES TEST PANELS: Cylindrical chamber rolls on twin rails, opens for loading by moving to the left. It closes against a fixed end-place for evacuation.

FORMS VACUUM SEAL: Cover sheets, placed over and under the panel, contact the rubber-gaskets. They "envelope" the panel and form a vacuum tight seal.

Braze Honeycomb in Vacuum

Brazing of honeycomb panels is usually done in inert atmospheres.

Now, production-size equipment for doing the job in vacuum is on the way.

▪ Vacuum brazing of stainless honeycomb is moving from the lab to the production line. Pilot-scale brazing has proved so successful that a major aircraft company recently ordered equipment capable of handling in excess of 50 sq ft of material. Built by F. J. Stokes Inc., Philadelphia, the equipment will be used for fabrication structures for the Eagle air-to-air missile.

Honeycomb brazing is normally done in inert atmospheres, such as argon. The standard method for protecting the panel during brazing is to enclose it in a welded steel envelope; the air inside the envelope is replaced with argon; the whole package is then placed into a brazing furnace.

Avoids Welded Envelopes—The Stokes-Bukata process, announced late in 1958, utilizes an entirely different procedure. It avoids the need for making the expensive and time-consuming welded envelopes to contain the work.

Instead, the honeycomb can be rapidly loaded between two heating trays which are water cooled to permit the use of rubber gaskets. Cover sheets, placed over the honeycomb and contacting the rubber gaskets, complete the envelope. Next, the furnace chamber is closed and evacuation proceeds.

Why use vacuum at all? According to A. D. Garwood, manager of F. J. Stokes vacuum metallurgical department, vacuum is a true inert atmosphere—the best you can get per dollar capital investment.

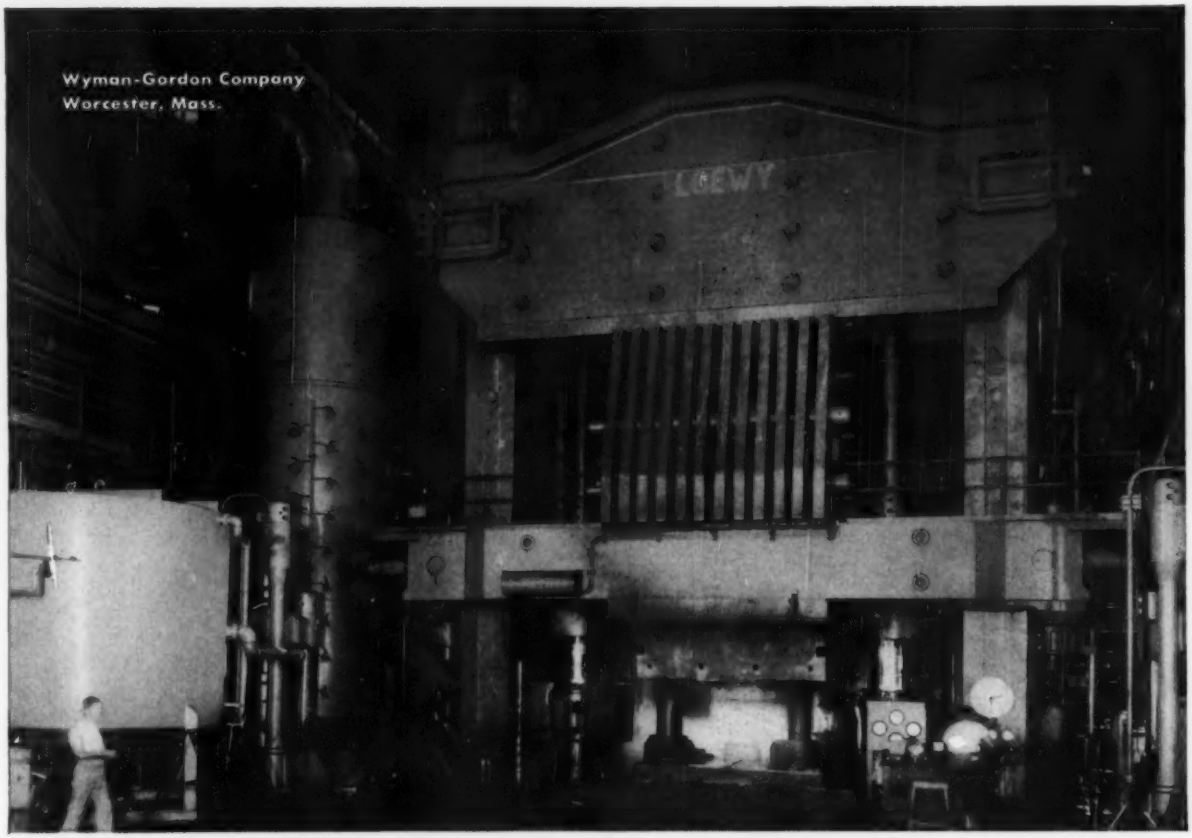
Contains Impurities — Argon merely substitutes a non-reactive molecule for an air molecule, Mr. Garwood points out. These inert-gas molecules are bound to contain a certain amount of oxygen-containing impurities no matter how carefully the gas is dried.

Both the core and the skin in stainless steel honeycomb are prone to form oxides with these impurities. And the oxides will inhibit the flow of the brazing material.

How about surface contaminants? In cleaning honeycomb before brazing, elaborate degreasing steps and solution dips are used. Preliminary work with the Stokes-Bukata process indicates that the combination of elevated temperatures and high vacuum removes many residual surface contaminants through evaporation.

Quality Is High—"The quality of the brazed panels," says Mr. Garwood, "shows that, in regard to joint uniformity and absence of voids, they clearly exceed industry's specifications. And the physical properties are up to industry's standards."

Both Stokes and the process inventor, Stephen Bukata, feel that the vacuum approach on newer honeycomb materials shows promise. Such materials as titanium and molybdenum show even greater oxygen sensitivity.



Operation Big Squeeze:

World's largest presses lubricated by Cities Service Pacemaker Hydraulic Oils

Once a forging operation for horse-drawn carriages, Wyman-Gordon Company now operates the world's largest presses, with the newest one capable of exerting 50,000 tons pressure.

Reason for this tremendous press is the increasing need for strong, lightweight metal parts for aircraft. Today, as for many years, no military or transport aircraft takes to the air without Wyman-Gordon forgings.

With its huge, hydraulically operated presses, Wyman-Gordon is able to forge huge pieces with one big squeeze. Sometimes a whole unit for a landing-gear strut. Or one mammoth wing spar.

The press that exerts 50,000 tons pressure is described by Wyman-Gordon as "the largest single machine ever conceived"—and few people would argue the point after seeing it.

Mounted in a pit that extends nine stories beneath the earth, the giant press is over 114 feet high and weighs 10,605 tons, 6,450 of which moves up and down.

Cities Service is justifiably proud that here as in all of Wyman-Gordon's presses with 18,000 tons pressure or better, hydraulic lubrication is provided by Cities Service Pacemaker Oils.

It is hardly necessary to point out the incredible demands that such machinery makes of its hydraulic lubricants... and certainly it is self-evident that if Cities Service Pacemaker Oils can perform satisfactorily in the world's largest presses, they'll do the same for you. Talk with a nearby Cities Service Lubrication Engineer. Or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.

Entire Rig Is Operated by One Man with the few simple controls shown here. With a flick of his fingers he can put on a squeeze of 50,000 tons. Result is extremely strong lightweight forgings for aircraft.

Lubrication Foreman has mammoth responsibility. Here, he checks dispenser for Cities Service EP 20 Lubricant... used on main bed and columns of large presses and other areas subject to extreme pressures.

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NATIONAL ACME'S "ZONE OF RESPONSIBILITY"
INCLUDES ALL PHASES OF COST REDUCTION

Check YOURS . . . Then Check National Acme

Direct Costs: these include direct dollar savings as realized by the McCulloch Corporation . . . an "every day" job for Acme-Gridleys.

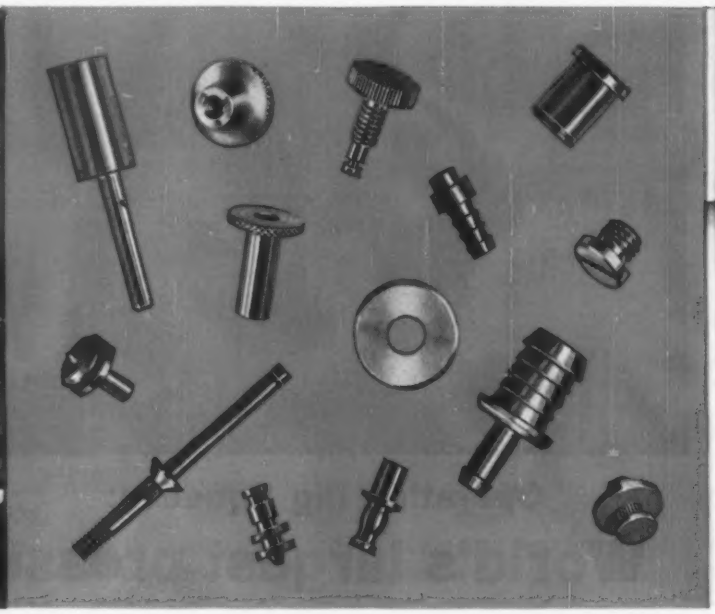
Indirect Costs: effecting important savings in maintenance, downtime, scrap reduction, tool costs, etc.

Product Redesign: teaming with your design group to take full advantage of Acme-Gridleys' cost reducing capabilities.

Direct Material Costs: our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems.

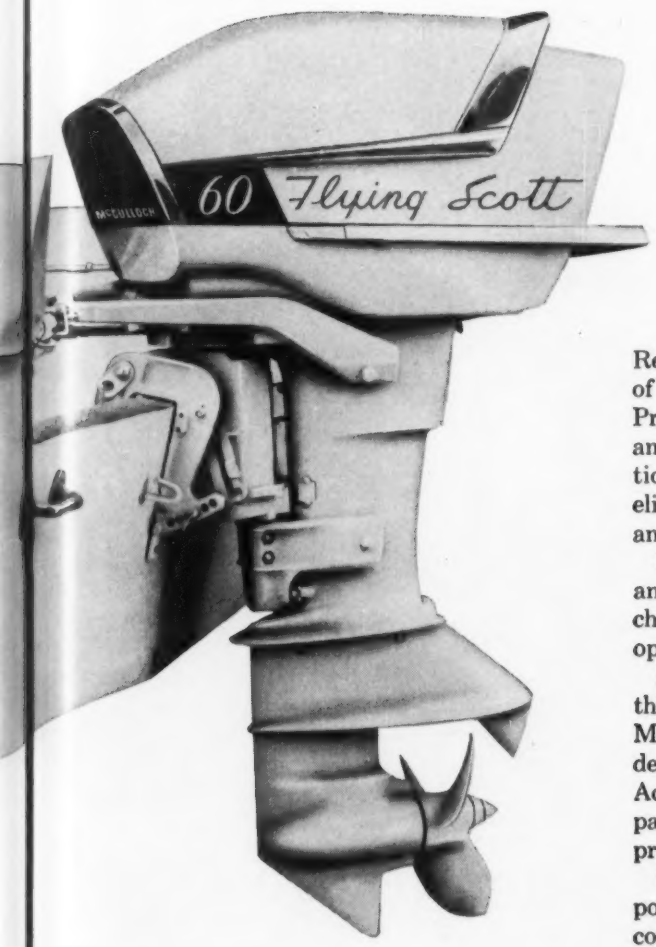
Make-or-Buy Reviews: in many cases our Contract Division can assume your production headaches and relieve you of immediate capital investment.

Spot Modernization: pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.



McCULLOCH CORPORATION LOGS 200% COST REDUCTION

. . . with Acme-Gridleys



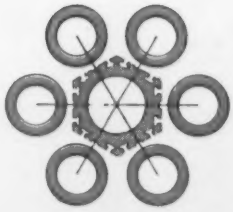
Reduced cost-per-piece of tilt-lock knobs was but one of the enviable savings made possible for the Marine Products Division of the McCulloch Corporation by an Acme-Gridley RA-6 Spindle Automatic. In addition, McCulloch boosted output 200%, practically eliminated scrap losses, and greatly improved finish and final appearance of this small but critical part.

Previous production methods required one primary and two secondary operations. Now, complete machining—including deburring, is done in one automatic operation on the Acme-Gridley.

Dramatic savings in the production of parts like this make Acme-Gridleys a vital, cost-saving cog in McCulloch's highly efficient production set-up. Evidence of this leading manufacturer's high regard for Acme-Gridley efficiency is the fact that 14 different parts for their popular 60HP "Flying Scott" are produced on the rugged, versatile RA-6 Automatic.

It will pay you to thoroughly study the savings possible with Acme-Gridleys. Call, write or wire for complete details on industry's most modern approach to tangible cost reduction.

Pioneer in Circumferential Automation



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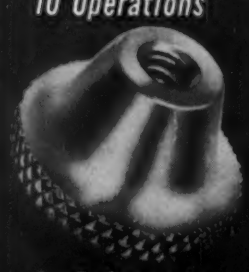
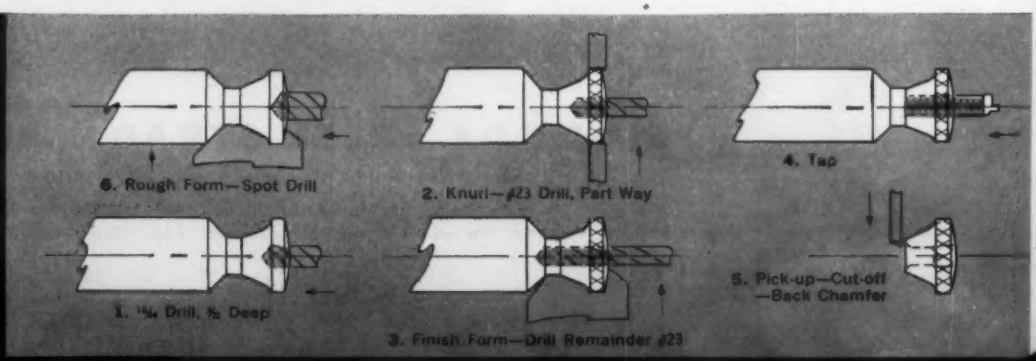
10 Operations



in 5 Seconds


6. Rough Form—Spot Drill
2. Knurl—#23 Drill, Part Way
4. Tap
1. ¼ Drill, ⅝ Deep
3. Finish Form—Drill Remainder #23
5. Pick-up—Cut-off —Back Chamfer

NEW Signode air power sealer reduces strapping time

This new Signode Model RCNS pneumatic sealer features a pistol grip that makes it easy and convenient to seal ¾-inch steel strapping with one hand. It weighs only six pounds. The operator simply sets the tool on the seal and pulls the trigger. Compressed air does the hard work—crimps every seal correctly, positively, quickly.

Model RCNS 3435 pistol-grip, air power sealer

For added speed and convenience, the new pistol-grip sealer and a Signode PN air tensioner form a steel strapping combination that is fast, easy to handle, and minimizes waste motion and effort. You get tight, secure bundles every time.

The RCNS sealer is available on an annual rental or single payment basis, as are other Signode heavy-duty steel strapping tools. Let us arrange a demonstration on your premises at your convenience. Just write or call without obligation.

Send for new Booklet SPD 216 that describes the Signode line of air power tensioners and sealers and shows typical money-saving applications.

First in steel strapping

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Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 133.

Bright Aluminum Dip

An acidic solution for producing bright luster on non-silicon aluminum alloys is fully described in a two-page data sheet. It improves the surface finish of the metal and removes burrs without mechanical or manual operation. (MacDermid Inc.)

For more data circle No. 1 on postcard, p. 133

No-Corrosion Tubing

A bulletin describes tubing and pipe made of Hastelloy Alloys B and C, their applications, and their resistance to corrosive fluids. One section deals with the workability of these super - corrosion - resistant steels. (The Carpenter Steel Co.)

For more data circle No. 2 on postcard, p. 133

Electro Paint Gun

A bulletin covers principles and uses of a hand spray-painting gun using the electrostatic process. Numerous applications are illustrated, and paint savings are stressed. (Ransburg Electro-Coating Corp.)

For more data circle No. 3 on postcard, p. 133

Automatic Profiler

A bulletin describes a machine for 360° profile milling under tracer control. It follows an easily prepared sheet-steel template, and reproduces complex, irregular two-dimensional shapes with speed and accuracy. (Pratt & Whitney Co., Inc.)

For more data circle No. 4 on postcard, p. 133

Mill-Roll Grinding

A 20 - page handbook outlines correct procedures for grinding mill rolls, expanding on an article which appeared in the October 29 issue of The IRON AGE. All pertinent considerations are included. (Landis Tool Co.)

For more data circle No. 5 on postcard, p. 133

Magnet Material

An engineering bulletin describes Alnico VII A, an improved permanent-magnet material for core-type meters and instruments. It develops an energy value of 2.8 million (oriented). (The Indiana Steel Products Co.)

For more data circle No. 6 on postcard, p. 133

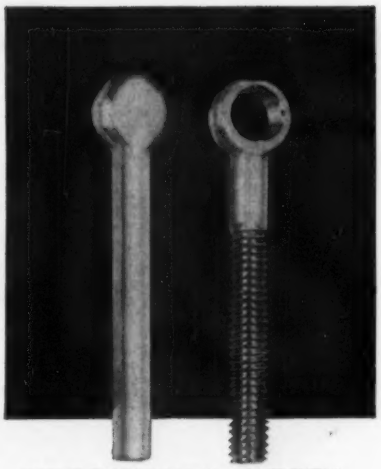
Miniature Switches

Vol. 11, No. 4 of "Uses Unlimited" illustrates some of the latest applications in product design and production machinery of a line of miniature precision switches. (Micro Switch)

For more data circle No. 7 on postcard, p. 133

Screw-Machine Info

A bulletin contains a host of handy information for users of screw machines. Included in tables are such information as weights per ft of all sizes and types of stock, rpm versus sfpm for various stock sizes, pieces per hour, thread data,



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FREE LITERATURE

and length of stock for 1000 pieces. Some information is included on a line of die heads and chaser grinders. (The Eastern Machine Screw Corp.)
For more data circle No. 8 on postcard, p. 133

Clear Coolant

A bulletin provides full information of a new coolant for cutting and grinding operations. A soluble oil, it affords very fine tolerances and a high degree of work visibility. (Shear-Speed Chemical Products)
For more data circle No. 9 on postcard, p. 133

OEM Equipment

A 60-page catalog illustrates hundreds of newly manufactured and surplus items of equipment used for original equipment manufacture or maintenance in diverse industries. A special section is devoted especially to hydraulics. (Groban Supply Co.)
For more data circle No. 10 on postcard, p. 133

Disk Grinding Wheels

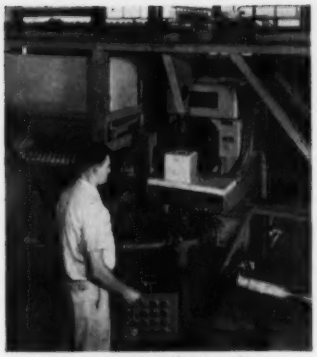
A four-page brochure discusses disk grinding wheels. Desired characteristics are described, and performance records on various disk-grinding operations are provided. A line of wheels is outlined. (The Macklin Co.)
For more data circle No. 11 on postcard, p. 133

Ferroalloys

A brochure lists ferroalloys for additions of chromium, silicon, vanadium, manganese, columbium, boron, titanium, and other alloying elements to steel, iron, and kindred metals. Various special alloys and metals are included. (Vanadium Corp. of America)
For more data circle No. 12 on postcard, p. 133

Steel Analyses

A 20-page pocket-sized booklet lists the compositions of 40 stainless steels, 184 alloy steels, and 105 carbon steels most often used in industry. Also included are important



Close-up of TOCCO Work Station for heating rivets.

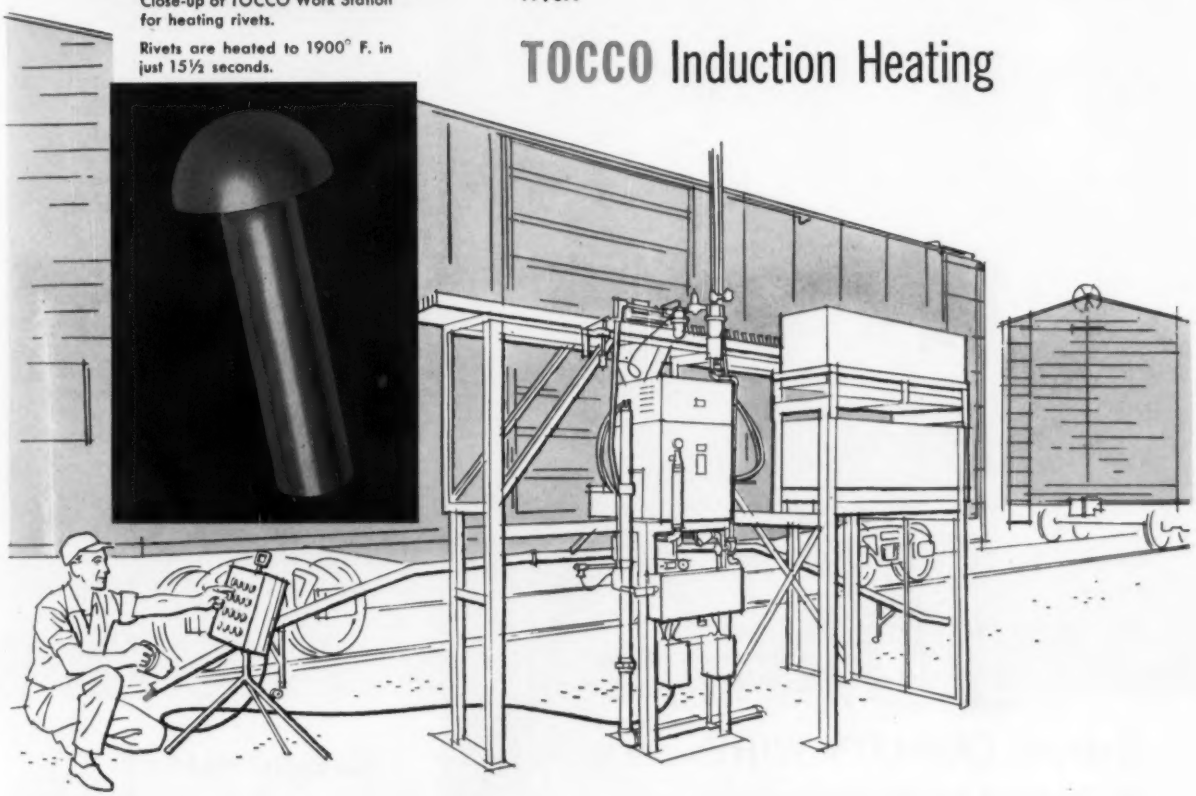
Rivets are heated to 1900° F. in just 15½ seconds.

How a Major Railroad Saves

OVER $17,000 PER YEAR

with

TOCCO Induction Heating



Rivets are delivered to the riveter at the right temperature, at the right time, and of the right size. This headwaiter for rivet-hungry box cars is a TOCCO Induction Heating Unit with ingenious tooling that selects the proper one of 10 sizes of rivets and shoots it to the riveter in seconds.

Savings in Labor—User reports a whopping labor savings of 6240 man hours per year since installing TOCCO.

Savings in Fuel—$1,500 is saved in fuel alone since the switch from an old-fashioned oil furnace.

Savings in Maintenance—Hundreds of dollars per year saved in maintenance costs since installing TOCCO.

Savings in Time—Formerly, riveters had to wait for rivets to get hot. Now there is no waiting time.

If you are seeking ways to speed production and lower costs, look to TOCCO for economical heating for forging, heat-treating, or brazing.

THE OHIO CRANKSHAFT COMPANY

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The Zinc Coated Wire with the Plated Look

Brytite Wire is so shiny bright and satin smooth that electroplating and special finishing operations are not needed —a valuable saving in labor and materials! The coating is so tight that it withstands severe deformation of the base metal—takes hard turns and twists without flaking, powdering, or peeling.

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FREE LITERATURE

Federal specifications with corresponding SAE, AISI, and AMS numbers. (Jones & Laughlin Steel Corp.)

For more data circle No. 13 on postcard, p. 133

Furnace Brazing

A 16-page bulletin on furnace brazing techniques describes advantages, design, materials, brazing media, supporting fixtures, and protective atmospheres and temperatures. (The Electric Furnace Co.)

For more data circle No. 14 on postcard, p. 133

Grinding-Wheel Use

A wall chart lists ten do's and ten don'ts for operator safety when using grinding wheels. (Write on letterhead to Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15.)

Distribution Duct

A foldout describes a new electrical distribution duct featuring fast, easy, and economical installation and safety throughout. It comes in modular units, in a wide range of ratings, and boasts low voltage drop. (I-T-E Circuit Breaker Co.)

For more data circle No. 15 on postcard, p. 133

Electric Hoists

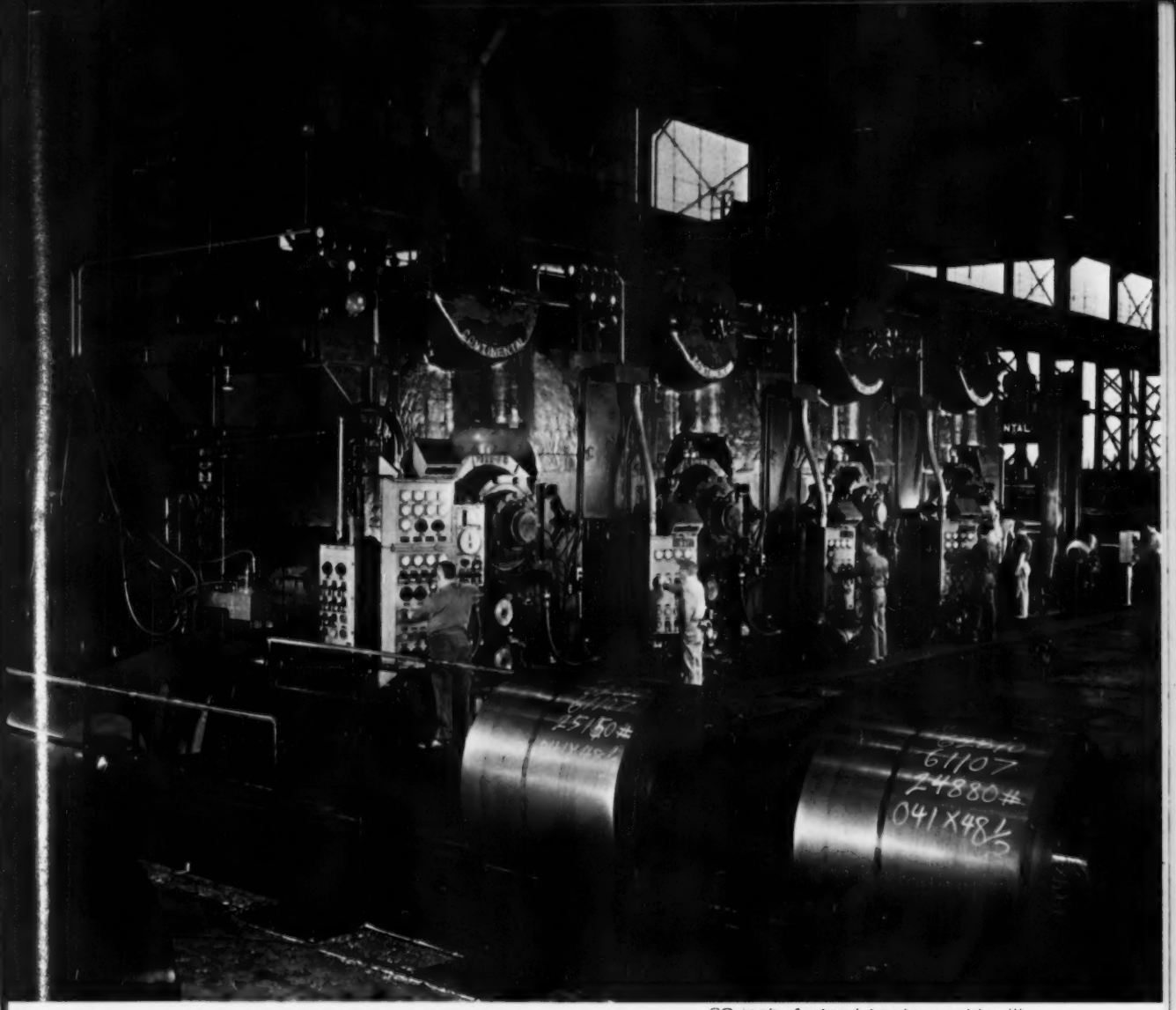
A bulletin describes a new series of electric hoists featuring a one-piece gear housing and frame of heavy steel, precluding any likelihood of misalignment or oil leakage. Capacities range from 500 to 12,000 lb. (Euclid Crane & Hoist Co.)

For more data circle No. 16 on postcard, p. 133

Stainless Steel Uses

A booklet compiles over 500 consumer products made of stainless steel and the companies that manufacture them. A section outlines benefits from using stainless. Another section covers the metal's evolution and technology. (Union Carbide Metals Co.)

For more data circle No. 17 on postcard, p. 133



60-inch, 4-stand tandem cold mill

BLAW-KNOX COLD STRIP MILLS

Blaw-Knox designs and builds all types of cold reduction and temper mills for ferrous and non-ferrous work. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

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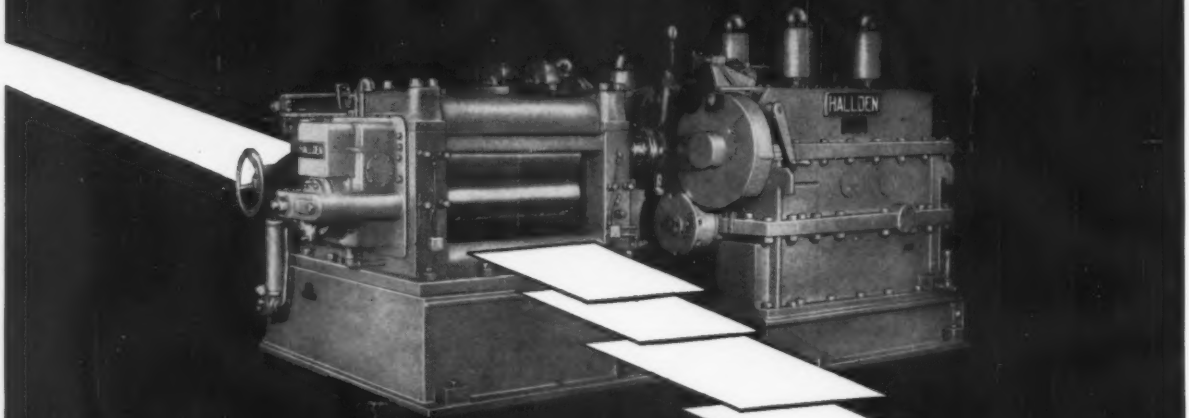
NOW - A NEW "Push Button" FLYING SHEAR

NO DOWN TIME to change cut length or synchronization



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Revolutionary new designs now permit synchronization adjustment AND gear changes to be made without stopping production. Changes in cut lengths are made in just seconds.

Hallden Shears can be furnished in processing lines built by leading machinery manufacturers the world around.

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Associates: The W. H. A. Robertson & Co. Ltd. Bedford, England

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Abrasive Finishing

A data sheet covers abrasive finishing of brass and bronze in all forms. Complete data are included on wheel heading, lubrication, surface speed, and recommended buff types. (The Lea Mfg. Co.)

For free copy circle No. 21 on postcard

Conveyor Systems

Two catalogs describe pneumatic, mechanical, and hydraulic conveyor systems for collection and processing of metal chips, reclamation of cutting oils, process conveying, and waste disposal. (National Conveyors Co., Inc.)

For free copy circle No. 22 on postcard

Water Gages

A technical bulletin provides data on high-pressure boiler-water gages for service to 3000 psi. A new design is employed to provide a very clear indication for either direct or TV reading. (Jerguson Gage & Valve Co.)

For free copy circle No. 23 on postcard

Cooling-Tower Drives

A bulletin describes high-horsepower worm-gear drives, designed specifically for cooling-tower service. They quietly handle heavy-duty fans in extreme heat and humidity. (The Cleveland Worm & Gear Co.)

For free copy circle No. 24 on postcard

Brightener

A liquid acid material used to brighten stainless, aluminum, and steel is described in a four-page usage sheet. It removes scratches, deburrs, reduces friction, and improves corrosion-resistance and adherence of plated work. (MacDermid Inc.)

For free copy circle No. 25 on postcard

Strip Tension Control

A report outlines the operation of a strip tension control system used in minimizing strip breakage on three continuous annealing lines. (Bailey Meter Co.)

For free copy circle No. 26 on postcard

Crucibles

A product bulletin describes beryllium-oxide crucibles for melting high-purity or reactive metals. (The Beryllium Corp.)

For free copy circle No. 27 on postcard

Recorders

Features and accessories of a complete line of all types of process-recording instruments are presented in a 12-page illustrated brochure. (General Electric Co.)

For free copy circle No. 28 on postcard

Process Control

Product bulletins describe devices for an integrated system of electric process control. The system features two-wire dc transmission, and no line power at field-mounted transmitters and transducers. (Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 29 on postcard

Specimen Polisher

A bulletin describes an electrolytic lap-polishing apparatus which easily handles metals difficult to polish by usual methods, such as tungsten, rhenium, molybdenum, and their alloys. (William J. Hacker & Co., Inc.)

For free copy circle No. 30 on postcard

Alloy-Steel Screws

A 36-page product data handbook details methods of manufacture and specifications on a complete line of alloy-steel screws.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **12/3/59**

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

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41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
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THE IRON AGE

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FREE LITERATURE

Featured is a new socket-head cap screw with a tapered head which improves overall working efficiency 27 pct. (Mac-it Parts Co.)

For free copy circle No. 31 on postcard

Polycarbonate Shapes

A bulletin contains descriptions and suggested applications for a line of polycarbonate-resin rod, plate, disks, and tubing. They are machinable on standard metalworking equipment. This material features high impact strength, heat resistance, and electrical insulating characteristics. (The Polymer Corp. of Pennsylvania)

For free copy circle No. 32 on postcard

Spectrometers

"An Introduction to Emission Spectrochemical Instruments" is a four-page brochure describing principles of operation, applications, and a company's line of emission instruments. (Baird-Atomic, Inc.)

For free copy circle No. 33 on postcard

Gold-Plating

A reprint is again available of an eight-page paper on industrial gold-plating, originally delivered at a society meeting in 1953. It treats bath composition, equipment, and operating conditions, as well as comparative metallurgical characteristics of 24k gold plate on various base metals. (Sel-Rex Corp.)

For free copy circle No. 34 on postcard

Bearing Aluminum

A 12-page brochure presents information on a line of tubular and solid aluminum bars for bearings. Numerous economic advantages of aluminum as a bearing material are listed. (The Bunting Brass and Bronze Co.)

For free copy circle No. 35 on postcard

Bearing Balls

A complete reference on essential ball information, a new precision bearing ball catalog includes the new AFBMA standards and a master table of ball grades and tolerances. A selector chart gives information on balls of all types of materials. (Hartford Steel Ball Co.)

For free copy circle No. 36 on postcard

Valves

A valve "Buyer's Guide" cross-indexes a complete valve line with the valves of 16 other major manufacturers by designation. It then presents complete specifications on the author company's line, as a further aid to selection. (The Ohio Injector Co.)

For free copy circle No. 37 on postcard

Roller Bearings

A new series of roller bearings featuring a patented one-piece cage design is described in a catalog. This design and longer and larger rollers permit higher speeds and greater loads, respectively. Bore sizes range from ¾ to 4 in. (The Torrington Co.)

For free copy circle No. 38 on postcard

Aluminum Forms

A technical brochure outlines properties of Olin Aluminum alloys in pig, ingot, and billet forms. This brochure is distributed by Olin's Northeastern distributor. (Henning Bros. & Smith, Inc.)

For free copy circle No. 39 on postcard

Heavy Industrial Trucks

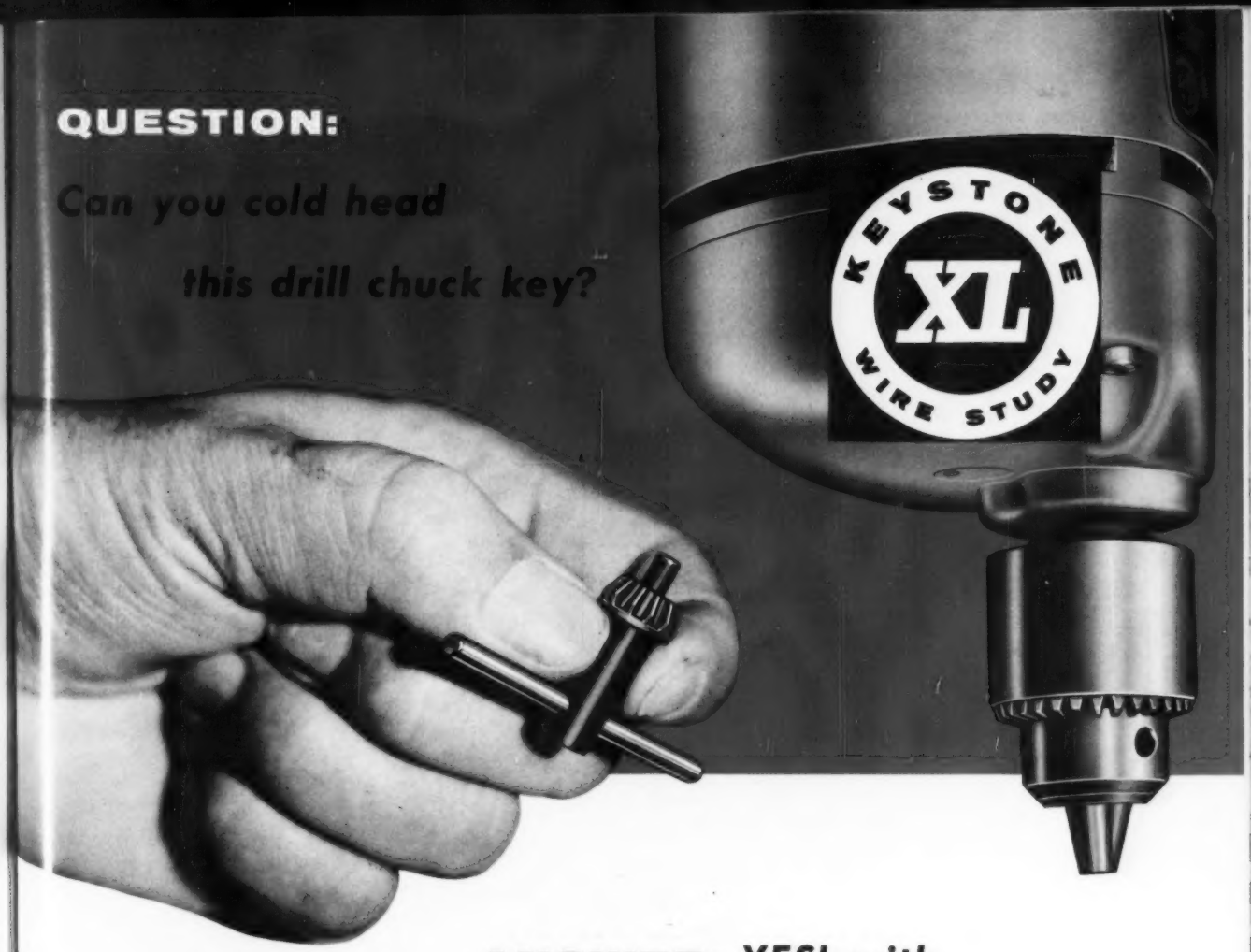
A six-page folder describes a new series, of four models, of heavy-duty electric industrial trucks. Capacities run from 3 to 5 tons. (The Elwell-Parker Electric Co.)

For free copy circle No. 40 on postcard

Overhead Handlers

A 56-page catalog features a line of overhead handling systems of track, cranes, trolley, switches, and other electrification, as well as monotractors and auxiliary equipment for monorail systems. Hundreds of interesting applications in many industries are listed. (The American Monorail Co.)

For free copy circle No. 41 on postcard



ANSWER: *YES! with*

CENTRAL SCREW COMPANY *engineering and KEYSTONE XL WIRE*

Questions like this are asked every day at Central Screw Co., Chicago, Ill.—and this is a typical answer! For Central Screw depends on Keystone XL Wire to head more than 7,500 stock items by the millions—and for many of its 20,000 specials. Here, as with many other progressive fastener manufacturers across the country—"know-how" combines with Keystone XL Wire quality and flowability to produce a superior product at sharply reduced costs.

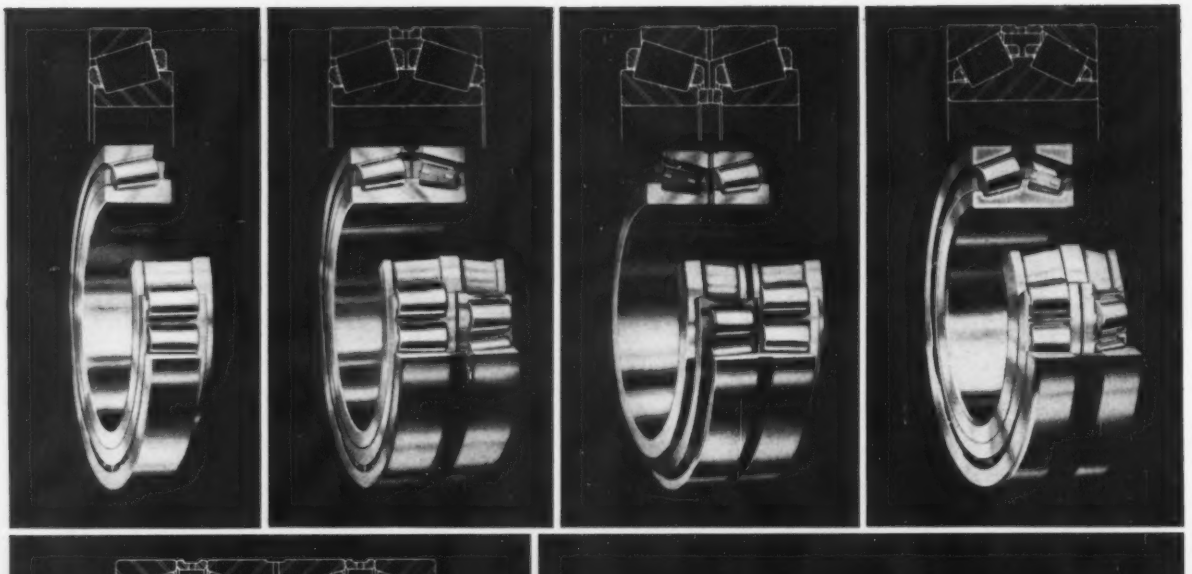
For example, by cold heading this drill chuck key, gear cutting was eliminated and machining was reduced. Overall costs were cut about 50%. This is one of *millions* of examples of how Central's "Fasteneering"® profitably puts Keystone XL Wire to use. You can do the same. Your Keystone representative will help you. Call him!

Keystone Steel & Wire Company, Peoria 7, Illinois

Five operations now produce this chuck key: heading on a 2 blow header, cut pointing, drilling, chamfering and heat treating.
ACTUAL SIZE
More Central Screw examples of Keystone XL Wire flowability are (above) this fastener with an 8 diameter thin shell head, and (right) fastener with 6½ diameters in the sharp, clean head and square shoulder.

KEYSTONE

WIRE FOR INDUSTRY



Torrington offers every type

Single-row tapered roller

•

Two-row tapered roller, solid cone

•

Two-row tapered roller, solid cup

•

Steep angle, two-row tapered roller

•

Four-row tapered roller

•

Conical roller thrust

•

Patterned for performance... Torrington Tapered Roller Bearings

Torrington Tapered Roller Bearings are made to virtually every design pattern for your particular performance requirements.

There are single-row, double-row... four-row tapered roller bearings—all in regular or steep angle design for radial and thrust loads—and conical roller thrust bearings for heavy thrust loads. Each is designed for dependable service in its operation.

Whether your application calls for a catalog bearing, or one custom-built to your specifications, you can rely on Torrington for utmost precision of manufacture, quality material, advanced metallurgy... and engineering experience based on the manufacture and application of every major type of anti-friction bearing. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

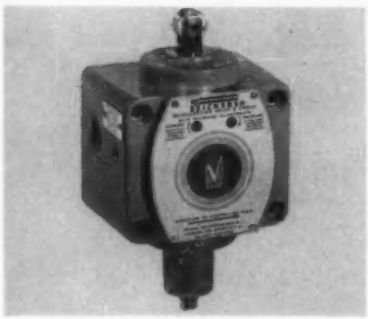
TORRINGTON BEARINGS

Every Basic Type of Anti-friction Bearing

TAPERED ROLLER • SPHERICAL ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

New Materials and Components

Adjustable Valve Gives Optimum Deceleration



Rated at 5 to 25 gpm, a deceleration valve for hydraulically actuated machines can be used in up to 60-gpm uses without malfunction. External adjustment of initial back pressure gives the desired deceleration rate. This feature reduces machine-tool setup time by eliminating special valves, spool modifications, and deceleration cam alterations. Spool stroke length remains constant regardless of volume setting. Maximum recommended pressure is 3000 psi. Threaded-port or gasketed models are available. A reverse-flow check valve is optional. (Vickers Inc.)

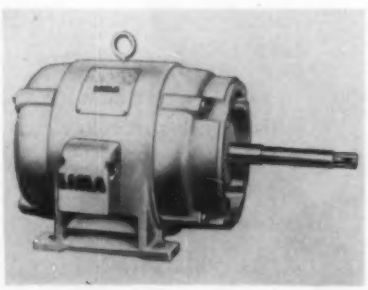
For more data circle No. 42 on postcard, p. 133

Sealed Bearings for Abrasive Environments

A new line of sealed roller bearings is recommended for high-load applications in abrasive environments. Designed for a special application, the bearing pictured is typical of the line. A buna-N, steel-backed, rubber-bonded seal keeps dirt, dust, and abrasive grit from bearings and races. Life-lubricated, it has a dynamic capacity of 13,400 lb. It has 21 crowned rollers, 1.750-in. ID, and a spherical OD of 3.3465 in., designed to fit a mating spherical surface. (Rollway Bearing Co., Inc.)

For more data circle No. 43 on postcard, p. 133

Dripproof Pump Motors Rate From ½ to 75 hp



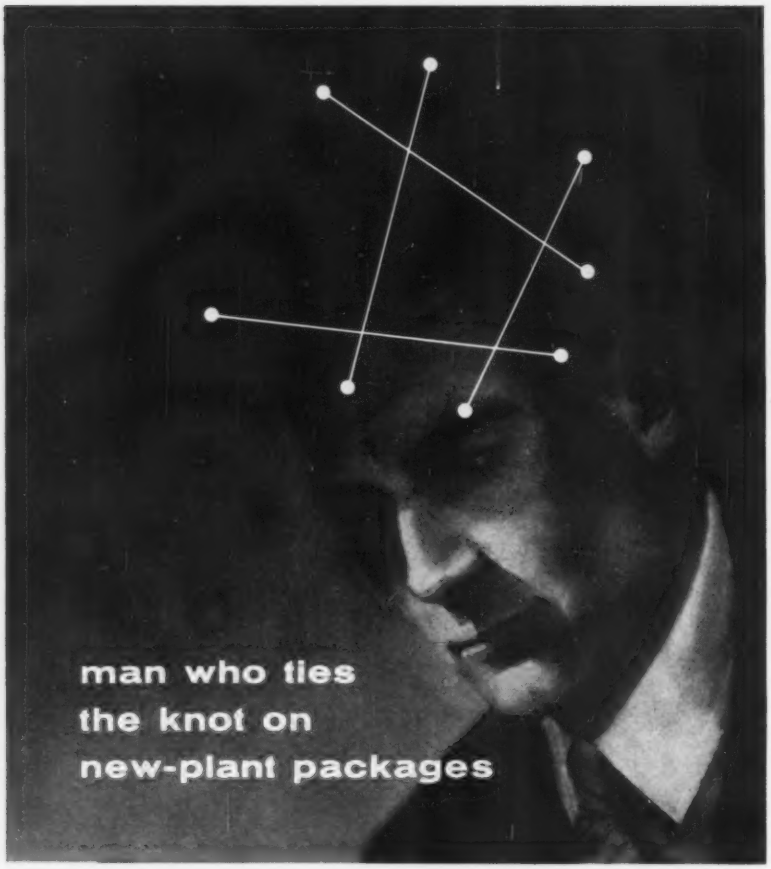
A line of dripproof close-coupled pump motors rate from ½ hp at 900 rpm through 75 hp at 1800 rpm, and come in frames 182 through 405U. The diecast aluminum rotors have dual cooling fans, and the entire rotor assembly is dynamically balanced. Prelubricated sealed ball bearings require no cleaning: the correct quantity of lubricant is sealed in, and dirt and moisture are sealed out. These motors come 3- or 2-phase, in all frequencies and commercial voltages below 600 v. (The Lima Electric Motor Co.)

For more data circle No. 44 on postcard, p. 133

New Series of Hydraulic Gear Pumps

First in a newly designed series of hydraulic gear pumps to be introduced are two models rating at 13 and 20 gpm at 2000 rpm and 1500 psi. Completely pressure-balanced with automatic adjustment of wear plates, they have over 90-pct efficiency. The new design eliminates high-pressure bind. These pumps can be driven clockwise or counter - clockwise without any change or adjustment. They can also be used as high-efficiency motors without any change or adjustment. (Be-Ge Mfg. Co.)

For more data circle No. 45 on postcard, p. 133



The conveyor system "wraps up" the plant as a production unit. Designing such a system is a job for a *specialist . . . a specialist called in early.*

"The Man from Logan" offers *complete* conveyor engineering service. One of the industry's most comprehensive lines of equipment enables him to meet every need with the best answer.

Logan's thousands of successful installations cover the half-century through which modern production-line technology has grown. "The Man from Logan" focuses the benefit of all this experience directly on your job. He designs the *one right* conveyor system for your plant.

"The Man from Logan" is stationed nearby for your convenience. He takes over on design and specification and sees your system through to smooth operation. Phone or write today—there is no substitute for "The Man from Logan's" help *early* in new plant plans.

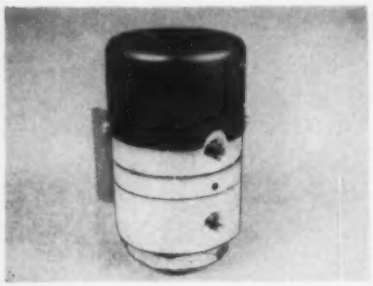
Logan Conveyors

LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.

DESIGN DIGEST

Reverse Relay

Offering fail-safe protection, a new reverse relay is a pneumatically operated device which reverses the action of a pneumatic valve, motor, or damper. Size is only 1 9/16-in.

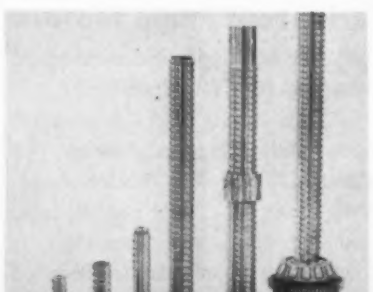


diam by 2⅝ in. long. It is recommended for use with final control elements such as valves, motors, and dampers when the action of the controller must be reversed. (The Powers Regulator Co.)

For more data circle No. 46 on postcard, p. 133

Precision Ball Screws

Recirculating ball-screw actuator assemblies for moving heavy machine components have pitch accuracy up to 0.0002 in. per ft. They feature a special internal bypass for recirculating the balls. Precision thread tolerances permit uniform, frictionless motion. Efficiency of



90 pct or better solves the stick-slip problem and reduces power requirements. The system offers a precise system of adjustable preloading to eliminate backlash. Designed special for each application, these assemblies come in shaft diameters from ¼ to 5 in., in

Here's how Olin Aluminum can help you get more extrusions for your dollar. We make aluminum — so we're thoroughly acquainted with the properties of all extrusion alloys. We're also experts in extrusion design and the related art of die-making. Combining this overall knowledge, we can help you achieve extrusions that use a minimum of metal with a maximum of efficiency.

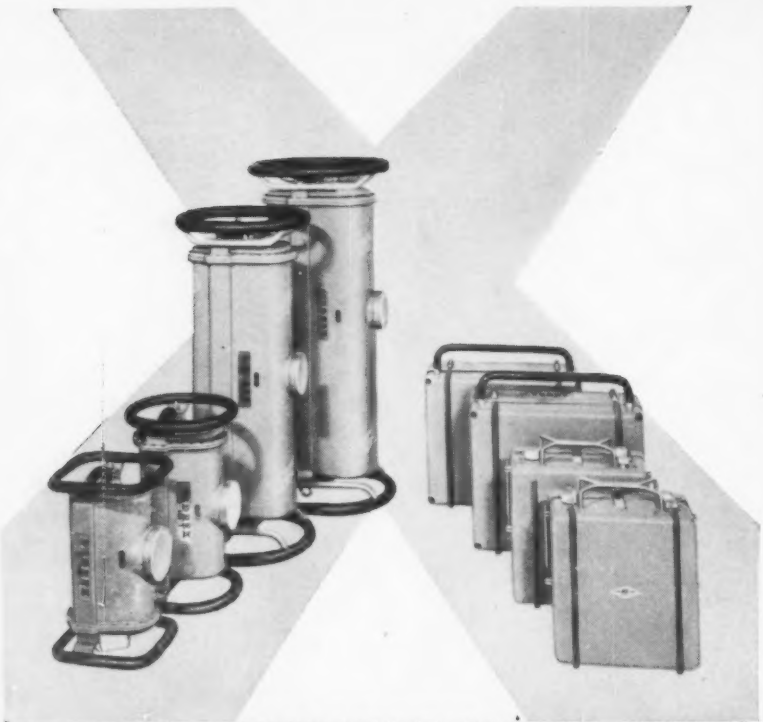
Come to us with an idea of what you want to accomplish and we'll show you how to do it best — whether it involves standard extrusions or elaborate, special-purpose, multi-port dies such as that used to produce the trademark extrusion illustrated.

And you can count on quality, too! For Olin Aluminum, as a primary producer of aluminum, tests its metal at every stage of the production process . . . using such advanced methods as quantometric analysis.

Moreover, your source of supply is assured by this fact: every Olin Aluminum customer is the terminal point of a massive, unbroken chain of supply that extends from the bauxite mine to the extrusion press.

OLIN ALUMINUM

OLIN MATHIESON • METALS DIVISION • 400 PARK AVE. • NEW YORK 22, N. Y.



FEDREX PORTABLE X-RAY UNITS

. . . low-cost line of X-ray equipment designed for safe, fast weld inspections

World's Finest

The most versatile machines in their KV ranges, Curtiss-Wright Fedrex Portable X-ray Units provide controllable penetration of materials ranging from thin aluminum to inches of steel. Easy portability is engineered into the compact, rugged machines.

NOTE THESE FEATURES:

Stepless, independent adjustment of KV and MA.

Direct reading KV and MA meters eliminate guesswork on exposure settings.

Built-in synchronous timer and exposure charts simplify set-ups, assuring accurate results.

5 MA current rating allows shorter exposures, *increasing* possible exposures per working day, while *decreasing* time involved in production interruptions.

All units are small, flexible. Removable rubber-covered handling rings at each end of X-ray heads permit easy handling, positioning.

Overload relays automatically shut off unit if it overheats—if maximum filament current is exceeded, or if high voltage flashover occurs.

All units are designed to accommodate variable power line voltages. FEDREX equipment will function normally with mobile or even improvised power supply.

Curtiss-Wright Field Engineers are available for consultation on your welding inspection problems. Write for full information.

PRINCETON DIVISION · CURTISS-WRIGHT CORPORATION
PRINCETON, NEW JERSEY

DESIGN DIGEST

lengths to 40 ft. Hardness of all parts is Rc 60 minimum, and shafts have a 12-microin. finish. (Scully-Jones and Co.)

For more data circle No. 47 on postcard, p. 133

Aluminum Polisher

A chemical polishing solution for aluminum has a super brightening additive built in. Eliminating chemical controls and analyses, this solution operates without interruption and produces high brilliance. (Colonial Alloys Co.)

For more data circle No. 48 on postcard, p. 133

Pendant Switch

For hoists and other equipment, a safe pendant switch now comes in a two-button model. The buttons are integral with the synthetic-rubber housing, which has special

watertight seals at the junctures. The result is 100-pct moistureproof and electrically insulated operation. The switch rates up to 460 v, 20 amp. (Joy Mfg. Co.)

For more data circle No. 49 on postcard, p. 133

Fume Suppressor

A fume and mist suppressor is designed for use in chrome plating, anodizing, bright dipping, and other finishing processes where gas generation is a problem. It forms a thin foam blanket on the surface of the process solution which traps gas bubbles as they arise. It also reduces solution loss from mist or spray, and reduces dragout. (Allied Research Products, Inc.)

For more data circle No. 50 on postcard, p. 133

HAVE YOU A HEAT TREATING PROBLEM?

Take it to your Commercial Heat Treater for:

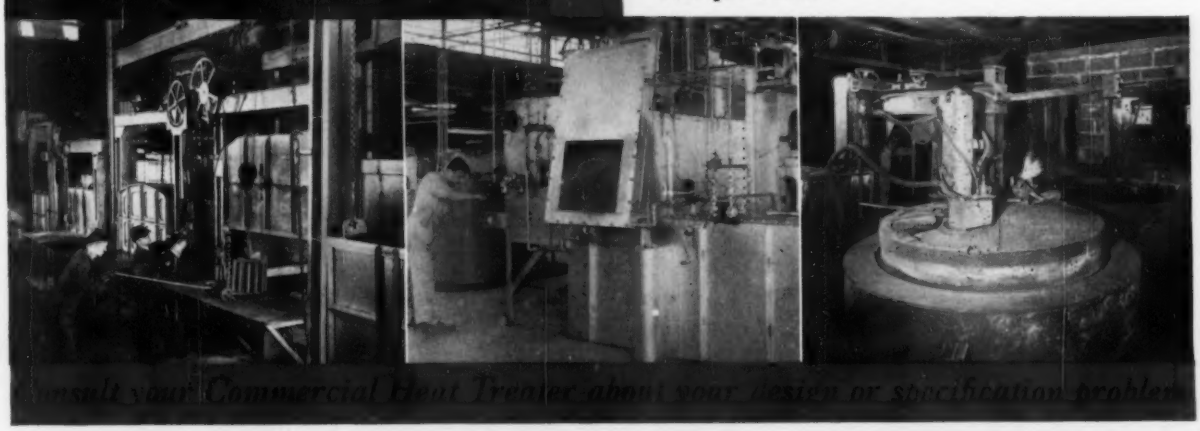
DESIGN: Technical advice about the *design* of metal parts requiring heat treating.

PROCESS: Facts as to the correct heat treating *process* required to achieve service requirements.

EQUIPMENT: The variety of modern specialized *equipment* needed for efficient cost saving operations.

SKILLS: The operational *skills* developed by years of experience in all phases of ferrous and non-ferrous metal treatments.

All these add up to SERVICE —the type of service only the Commercial Heat Treater can provide.



Consult your Commercial Heat Treater about your design or specification problem

American Metal Treatment Co.
Elizabeth, New Jersey

Benedict-Miller, Inc.
Lyndhurst, New Jersey

Bennett Heat Treating Co., Inc.
Newark 5, New Jersey

Commercial Steel Treating Corp.
Detroit 4, Michigan

Cook Heat Treating Co. of Texas
Houston 11, Texas

Dayton Forging & Heat Treating Co.
Dayton 3, Ohio

Dominy Heat Treating Corp.
Dallas, Texas

Fred Heinzelman & Sons, Inc.
New York 12, New York

Alfred Heller Heat Treating Co., Inc.
New York 38, New York

Ipsenlab of Rockford, Inc.
Rockford, Illinois

L-R Metal Treating Corp.
Newark 5, New Jersey

Metallurgical, Inc.
Minneapolis 14, Minnesota

Metallurgical, Inc.
Kansas City 8, Missouri

Paulo Products Co.
St. Louis 10, Missouri

Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania

Queen City Steel Treating Co.
Cincinnati 11, Ohio

J. W. Rex Co.
Lansdale, Pennsylvania

The Stanley P. Rockwell Co.
Hartford 12, Connecticut

Scott & Son, Inc.
Rock Island, Illinois

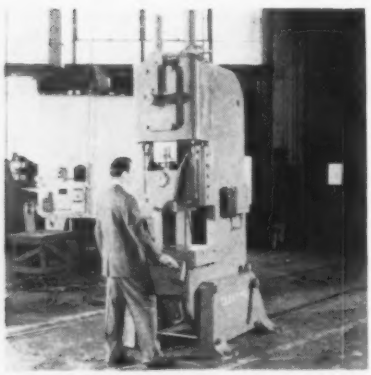
Syracuse Heat Treating Corp.
Syracuse 3, New York

Temperature Processing Co., Inc.
North Arlington, New Jersey

CANADA

Ipsenlab of Canada Limited
Toronto 16, Ontario

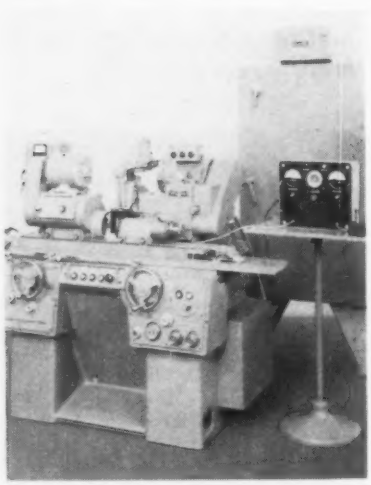
New Equipment and Machinery



60-Ton OBI Press Has Versatility, Long Life

A series of open-back inclinable presses now includes a 60-ton model. Built on the "modular" principle, it is made up of three basic units—frame, drive, and head. Completely interchangeable, these units solve problems of maintenance and obsolescence. The press features an air friction clutch using bronze friction plates. They operate in a sealed-in-oil enclosure which absorbs the shock of the "pickup" load during engagement. When the clutch is engaged, oil is momentarily trapped between the moving and stationary clutch and brake plates. Before it can escape, the oil starts the engagement of the clutch (or the setting of the brake). Very little wear takes place. (Clearing div. of U. S. Industries)

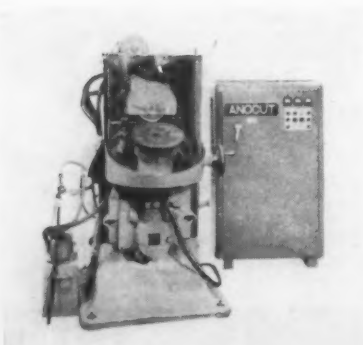
For more data circle No. 51 on postcard, p. 133



Grinds Mating Parts to Fit Within Millionths

A 4-in. grinder has a gaging system that enables grinding mating parts to fit within a few millionths. It will grind such critical parts as missile control valves, fuel injector plungers, and ultra-precision shaft-like parts, as well as one-of-a-kind parts such as master gages. All machine elements are under complete control in an automatic cycle to permit consistently accurate work. Tolerances achieved are 10-millionths on roundness, 20- on straightness, and 25- on size, with 4-microinch finish. Use of an air-jet gage prevents any chatter or taper due to gage pressure. In operation, ID and OD gages are set from masters, and clearance "dialed in." In the automatic cycle, time for average stock removal of 3- to 8-tenths is about 1 minute. The machine is designed for extreme rigidity and extra-precise alignment throughout. Smooth infeed slows for precise finish size. Coolant and hydraulic oil temperatures are exactly controlled. (Cincinnati Milling Machine Co.)

For more data circle No. 52 on postcard, p. 133

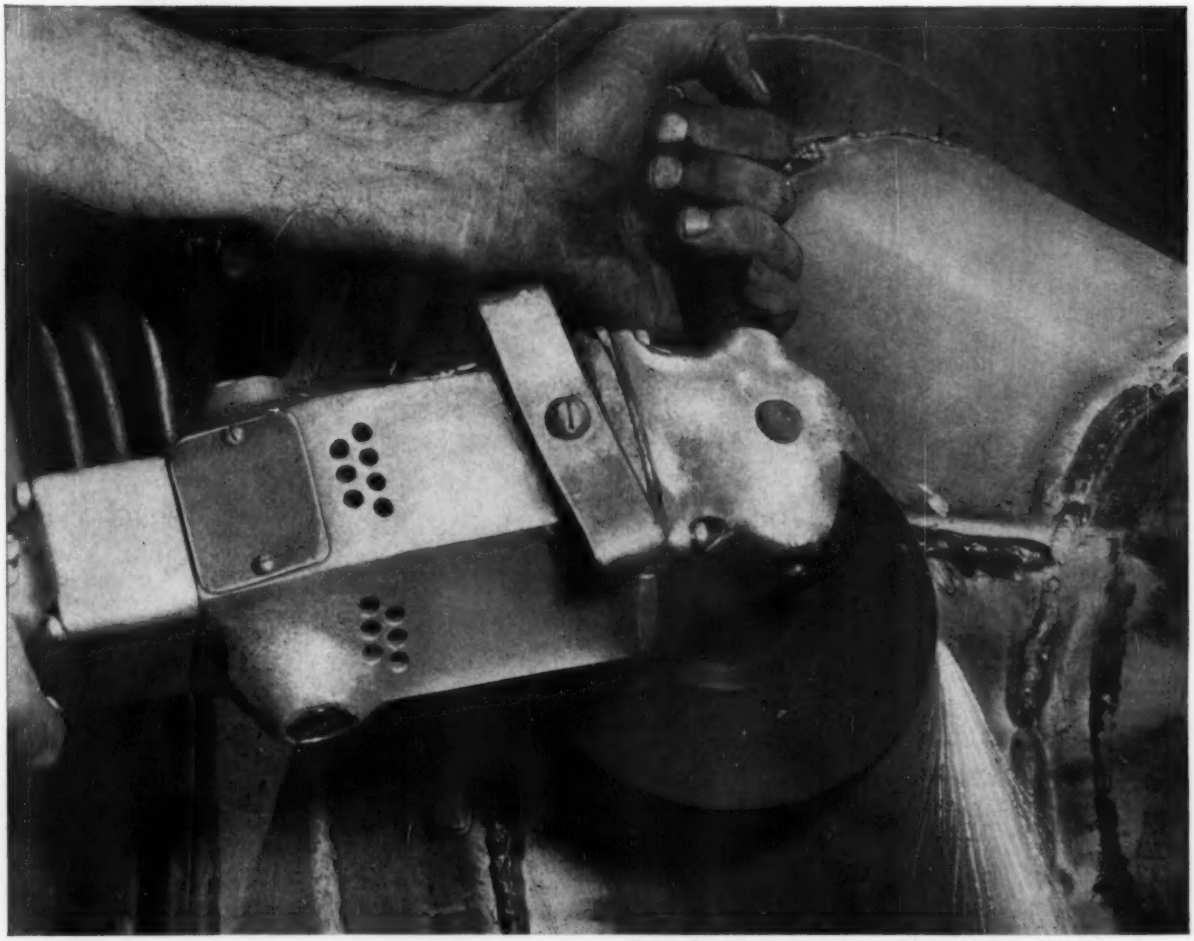


Grinds Milling Cutters Electrolytically

An automatic face-mill grinder employs the electrolytic stock-removal process. It produces substantial savings in diamond-wheel costs and cutter life, and improves work finish due to the face radius and reduced grinding run-out on the face mill. Also, carbide insert cracking and checking experienced with conventional grinding methods are eliminated. In a completely automatic cycle the machine grinds the lead angle, corner radius, face radius, dish, and soft-steel backing of inserted teeth. Tooth shape is controlled by a simple cam arrangement. Tooth cycle time averages 29 seconds, with 8-microin. finish. Four sizes take mills from 4 to 12-in. diam. Setup is fast. (Oliver Instrument Co.)

For more data circle No. 53 on postcard, p. 133

FLEXLITE RAISED HUB GRINDING WHEELS



Safety guard removed to illustrate full view of Flexlite Grinding Wheel

PEAK EFFICIENCY...PEAK STAMINA for high-speed portable grinding

From start to finish, U. S. Flexlite is the wheel that's built to reduce overhead. For smoothing and finishing welds, this is the most efficient, durable wheel in portable grinding. Comes in two types:

A24-H-BWD designed for use where fast rate of removal is the prime objective.

A24-Q-BWD designed for top efficiency and long life. Recommended for heavy-type applications such as heavy-gauge metals and heavy welds.

U.S. Flexlite Raised Hub Wheels are built for the utmost safety—their manufacture is controlled by unerring electronics. Layers of fiber glass reinforce the wheel. These wheels give you a cost-saving advantage right from the start.

• • •

Ask your "U. S." Distributor, or call or write U. S. Rubber, 10 Eagle St., Providence, R. I., or your local "U.S." District Office, or the address below.

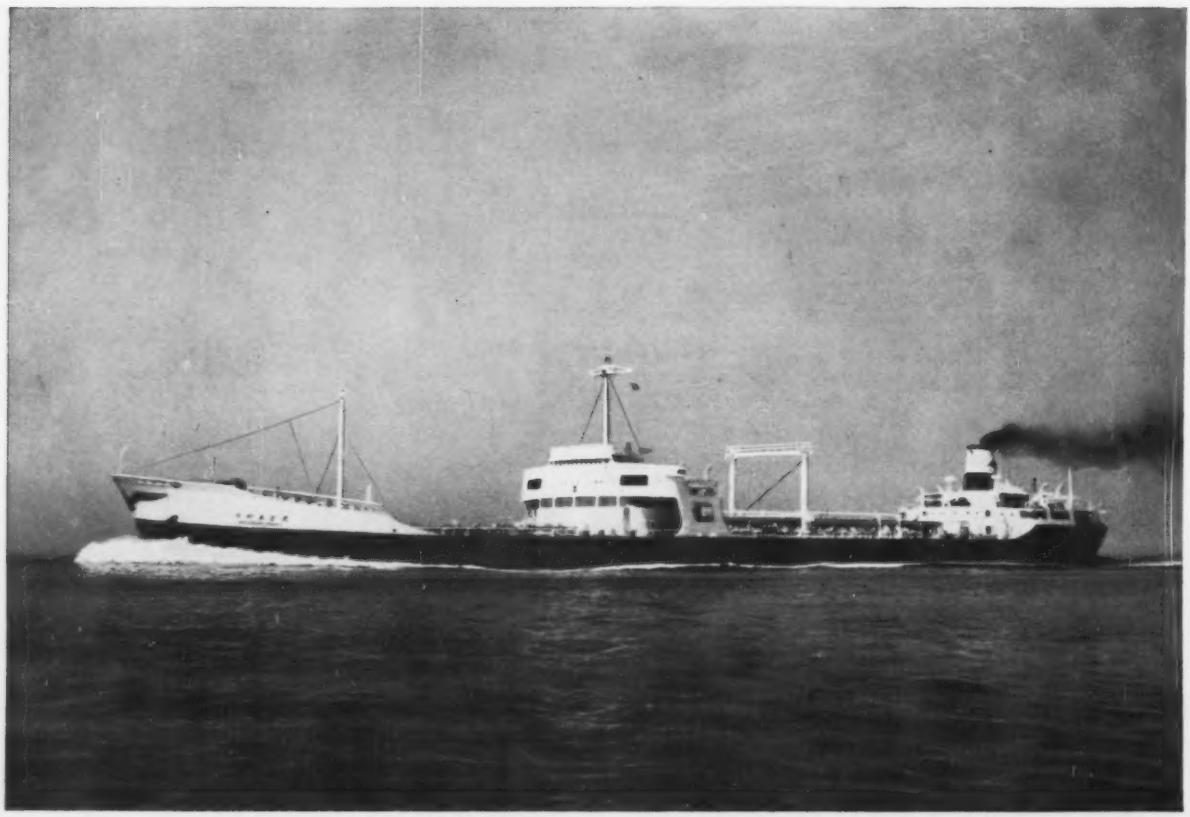
Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

NKK-STEEL, PIPES & SHIPS



Tankers built by NKK with NKK's steel carry oil produced with NKK's pipes

NIPPON KOKAN's capacity to produce from iron ore an astonishing variety of high-quality products assures customers that the most exacting requirements will be promptly and faithfully met.

Principal Products:
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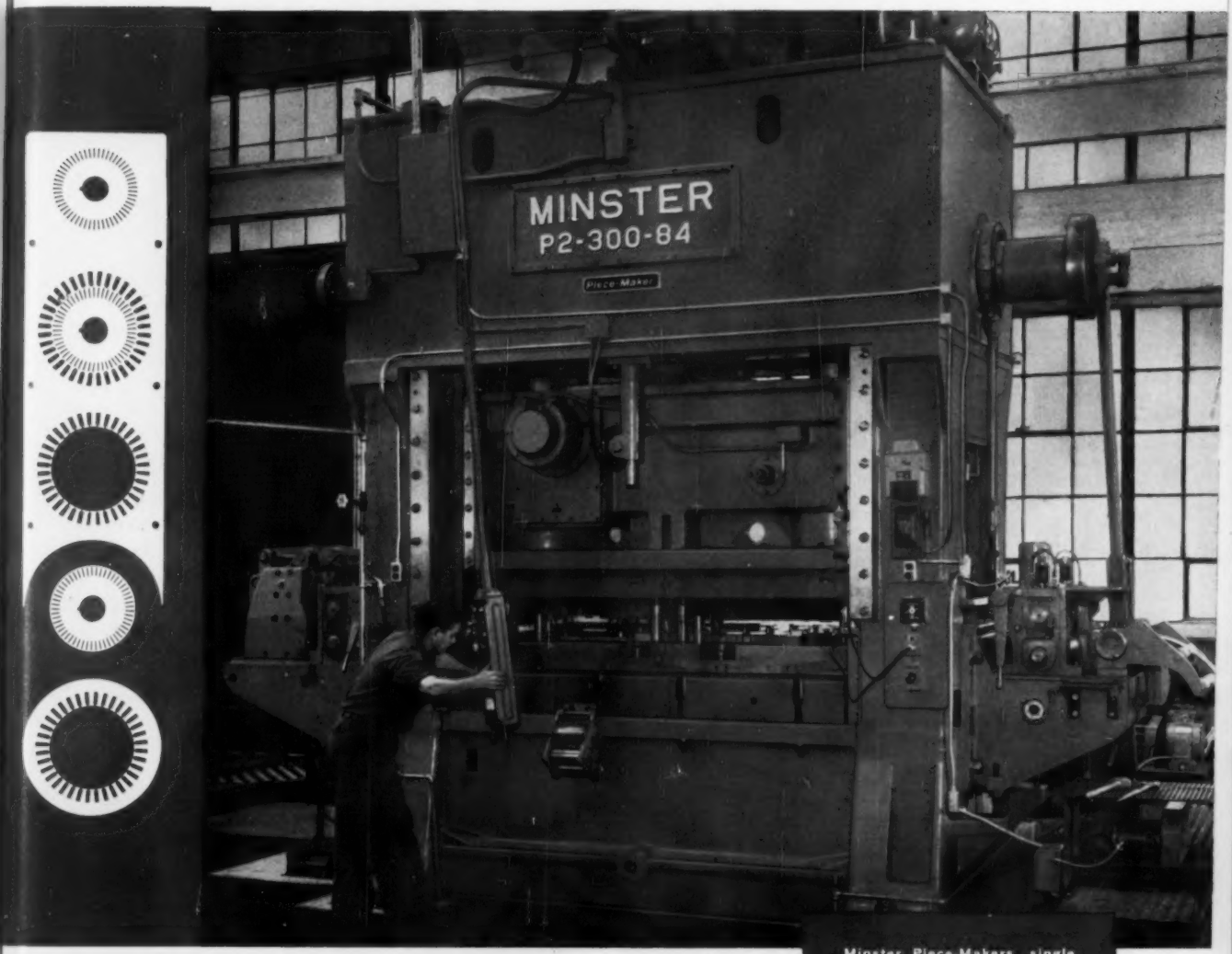
NKK

NIPPON KOKAN K.K.

(Japan Steel & Tube Corporation)

Head Office: Ohtemachi, Chiyoda-ku, Tokyo **Cables:** STEELTUBE TOKYO, KOKANSHIP TOKYO
New York Office: Room No. 1115, 39 Broadway, New York 6, N.Y., U.S.A.

AUTOMATIC PRODUCTION profits pay for the press



Minster Piece-Makers, single point and two point, have the precision and stability to give uninterrupted performance at the highest possible efficiency. 20 to 300 ton capacity.

Minster *Piece-Maker*® Presses

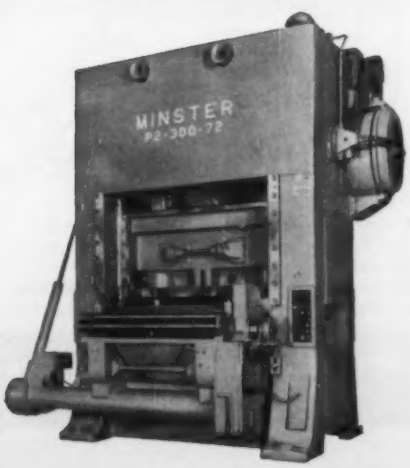
pay for themselves out of the higher profit per stamping you gain with Automatic Production.

In a Minster Piece-Maker you buy more parts per hour
+ higher production capacity per sq. ft. of space
+ rapid inventory turnover + less handling and storage
+ less waste and damage + longer die and press life

= higher profits that pay for the press

Minster offers a full range of press types and sizes for automatic production. Let us show you, in detail, how a Minster press on *your* job will pay for itself. Write or call

The Minster Machine Company • Minster, Ohio

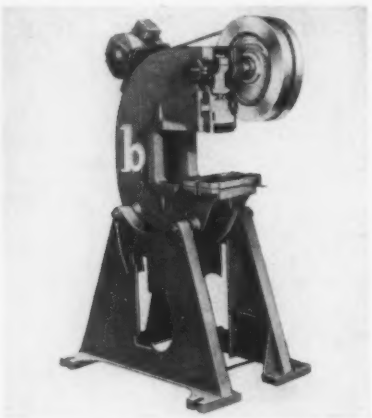


MINSTER®

NEW EQUIPMENT

8-Ton Punch Press

An 8-ton open-back inclinable punch press offers extra vertical and horizontal die space. Shut heights are available of 7¾, 10¾, or 13¾



in., with 1¼-in. stroke. Strokes of 1½, 2, 2½, and 3 in. are also available, as well as strokes of 1 in. and less. Bed area is 8 x 11 in., with 12-in. clearance between center of slide and frame. The press comes in both direct-belt-drive and back-geared models, the latter developing 40 to 100 spm. (Benchmaster Mfg. Co.)

For more data circle No. 54 on postcard, p. 133

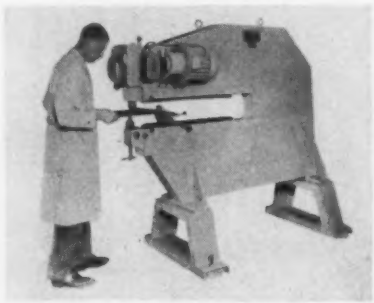
Heavy Band Saw

A completely hydraulic horizontal band saw has heavy cutting capacity, and operates at low tool cost. A hydraulically driven blade changes torque with changes in cutting conditions, and positive cutting pressure is maintained at all times at a selected constant rate. It has a 14 x 24-in. rectangular capacity. A central control console permits quick adjustments. (Machine Tool Div., Kalamazoo Tank & Silo Co.)

For more data circle No. 55 on postcard, p. 133

Plate Cutter

Virtually a complete sheet-metal shop, a sheet- and plate-working machine does straight, circular, and irregular cutting of mild steel up to 9/32-in. thick. It also does square cutting, slot cutting, nibbling, louver cutting, beading, joggling, edge



bending, flanging, and dishing. Other models have capacities to 13/32 in. (American Pullmax Co.)

For more data circle No. 56 on postcard, p. 133

Non-Scoring Drills

A process called Perma-Mark is employed on a line of drills to eliminate the burring of the shanks which obliterates size stampings and results in injury to chuck jaws and frequent off-center drilling. Essentially, in manufacture, the stampings are kept

CORE HOLE PLUGS A SPECIALTY

it takes quality ...to make quality

Enjoy the cost advantage of cold heading plus the dependable quality of products engineered and tested on the "right" production machine. Our specialty—multiple die single stroke transfer heading—insures well filled corners and quality chamfered edges. We welcome the opportunity of allying our skills with your needs.

Pittsburgh Plug and Products Corporation
P. O. Box 304 Evans City, Pa.

DYKEM STEEL BLUE

Stops Losses making Dies and Templates

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead

THE DYKEM COMPANY
2303G North 11th St. • St. Louis 6, Mo.

CUT SCRAPER TIME

END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

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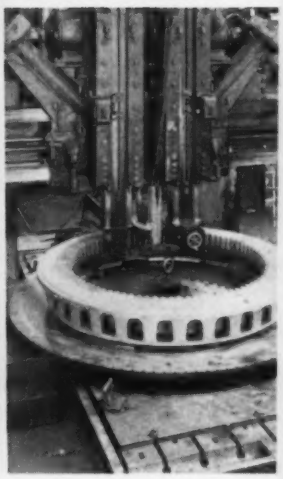
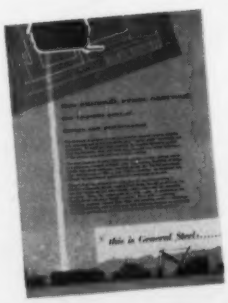
GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

...where industrial progress is cast in steel



PRODUCTION FACILITIES... COMPLETE AND MODERN



Write for folder: **How General Steel Castings Can Improve Product Design and Performance.** General Steel Castings, Station 201, Granite City, Illinois.

General Steel's large plants have complete facilities for producing, testing and machining castings to your specifications. Here are the facilities needed for quality production to suit your specialized requirements in cast steel structures . . . and steel castings used in cast-weld and composite structures.

Each plant maintains its own pattern, core making and molding departments, staffed by skilled craftsmen. Melting facilities capable of producing the correct steel for castings weighing up to 100 tons are complemented by the most modern foundry equipment available. Modern cleaning and finishing equipment, extensive heat treating facilities, specialized machine tools and the latest in non-destructive testing . . . radiographic, magnetic particle and ultra-sonic inspection devices . . . complete the picture.

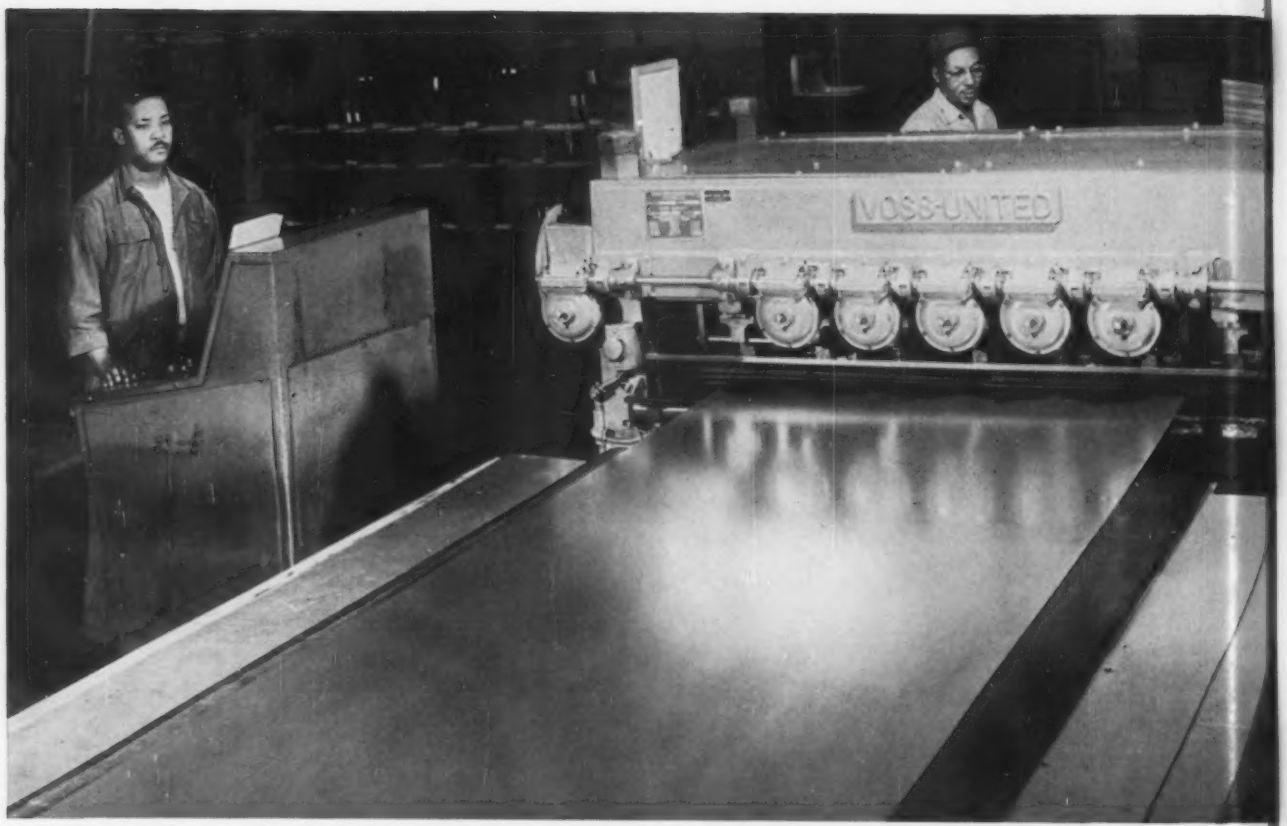
General Steel's services range from application analysis before the product is designed to field service after the product is in use. Let us demonstrate how cooperative teamwork can make all this skill and knowledge available to you.

GENERAL STEEL CASTINGS

GRANITE CITY, ILL. · EDDYSTONE, PA. · AVONMORE, PA.

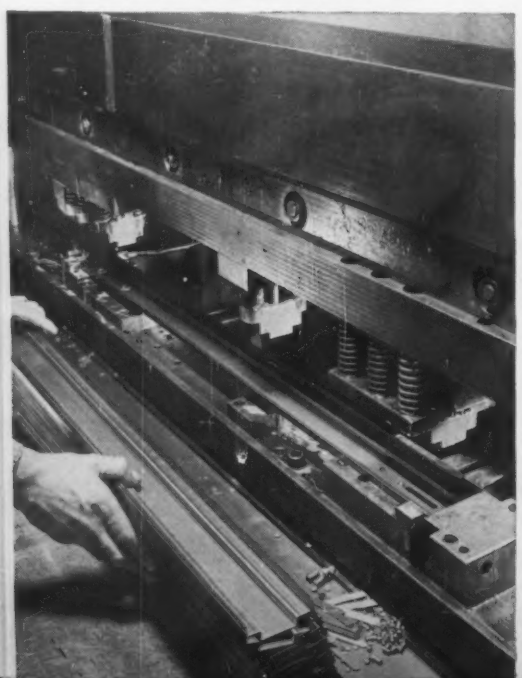
Pittsburgh Steel Sheet Used . . .

Where Flatness Makes Good Steel



Roller leveling to achieve dead flatness is easy with Pittsburgh Steel Co. Sheet, says The E. F. Hauserman Co.

A vertical member, showing sharp corners and severe bends, is embossed and punched on this 500-ton Cincinnati press brake.



Assembly for a flush steel and glass panel is being completed here. Rock wool batting provides sound control and insulation. Note reinforcing ribs on back of panel being placed on "sandwich."

Sandwiches

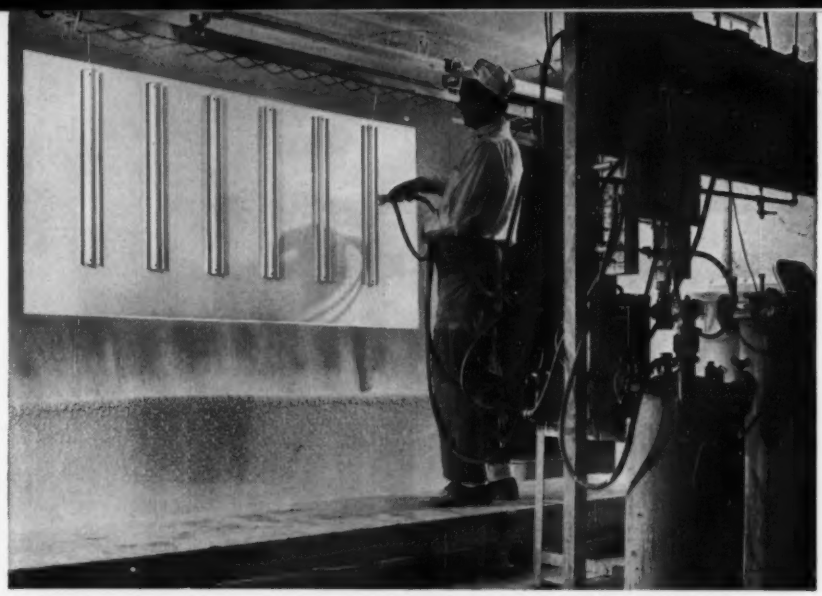
E. F. Hauserman hates ripples . . . The E. F. Hauserman Co., that is.

The Cleveland firm, world's largest producer of movable, interior walls, hates ripples because any kind of ripple in a wall panel is very visible to the eye. The slightest ripple produces a pattern of light and shadow.

To avoid rippling walls, The E. F. Hauserman Co. uses large quantities of cold rolled sheet steel from Pittsburgh Steel Co. because it's easy to achieve dead flatness with Pittsburgh Sheet.

Pittsburgh Steel Co. is one of the leading quality producers of cold rolled sheet steel—the most important raw product in the Cleveland plant. Hauserman must have flat panel plates which can be roller leveled to dead flatness. Sheet provided by Pittsburgh Steel helps achieve dead flatness with a minimum of processing.

The Hauserman company designs, engineers, manufactures and erects movable interior walls for commercial, industrial and institutional buildings on a nation-wide scale. Steel partitions provide greater movability, better appearance, lower maintenance, earlier occupancy, good access for utilities, efficient sound control, fire safety, greater rigidity and low cost through use of economical steel.



Paint line shows partition panel measuring 7 feet by 36 inches getting a primer coat. Good surface of Pittsburgh Steel's sheet shows up here where any flaws would mar paint job.

• **Gage**—Hauserman watches gage very carefully. Their Wean slitter is equipped with an Easterline-Angus electronic recording device which makes a written record of every inch of sheet processed. Pittsburgh Steel meets specifications for gage consistently.

• **Formability**—While flatness is a prime consideration, Hauserman also insists on excellent formability in sheet steel.

A great variety of formed parts, including cornices, inner bases, post caps, bases, spreader channels and reinforcing ribs, are made with severe bends and sharp corners. In some parts a lip of steel is bent back on itself through a 180-degree angle.

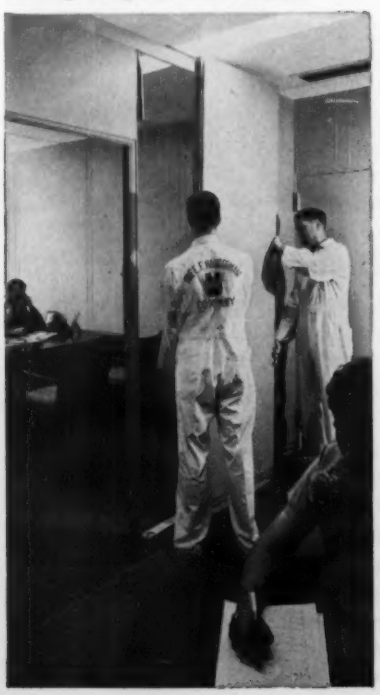
Because cold rolled sheet supplied by Pittsburgh Steel takes these strains without rips or tears, Hauserman has less scrapped material.

• **Surface**—Steel panels get three in-process inspections to make sure surfaces of panels and component parts are free of flaws. Defect-free surfaces make it possible for Hauserman to spray paint with assurance that the paint job won't be marred by flaws showing through.

• **Weldability**—Finally, Hauserman demands good weldability. Component parts and assemblies are fastened by both flash and resistance spot welding. Pittsburgh sheet makes a better product and reduces operating costs by taking a good weld without slowing production.

When a sheet user as exacting as The E. F. Hauserman Co. finds Pittsburgh Steel Co. sheet meets requirements consistently, you and other sheet users can confidently order from Pittsburgh Steel. Whatever your requirements may be—flatness, formability, surface, uniformity in gage, weldability or deep drawing quality—you'll benefit from putting Pittsburgh Steel sheet on your production lines. Trained personnel is available to help with any steel problem. Call a Pittsburgh Steel man today. You'll find him in any of the district offices listed below.

Typical installation of a Hauserman movable wall can be made without chasing occupants out of offices.



Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

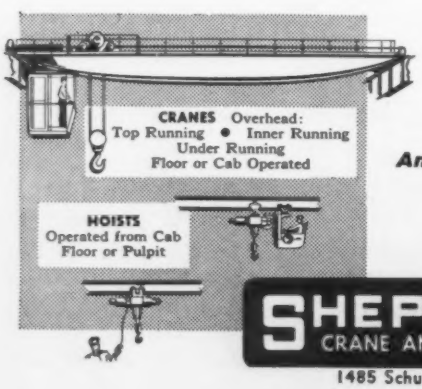
Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

SHEPARD NILES

INDUSTRIAL CRANES

TALK TO SHEPARD Niles first when you're considering a medium capacity crane. Because Shepard offers a wide range of standardized cranes for your selection . . . including welded plate girders for longer spans; Shepard's widely-praised welded I beam design for shorter spans; geared or direct drive trucks; Shepard's distinctive crane trolley (not hoist type); cab or floor operated; manual or magnetic control.

These Shepard Niles Cranes can be rated and applied for light, medium or heavy service. All component parts are designed and built by us expressly for crane service.



• Write for Bulletin illustrating Shepard Niles medium capacity cranes . . . ask to have a representative call at your convenience.

America's Most Complete Line of Cranes and Hoists Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION
1485 Schuyler Ave., Montour Falls, N. Y.

out of the chucking area, and the drills are hardened after stamping. The process is applied to four types of high-speed jobber's-length drills and six types of aircraft extension drills. (Republic Drill and Tool Co.)

For more data circle No. 57 on postcard, p. 133

Solid-Carbide Tools

An extensive line of solid-carbide fluted tools includes burrs, internal grinding tools, boring tools, reamers, drills, and routers, in a large range of shapes and sizes, up to ½-in. diam in most cases. (Kennametal Inc.)

For more data circle No. 58 on postcard, p. 133

Goggles

Two new types of goggles fit 99 pct of all users and fit over all prescription glasses. Pictured is the chipper's type, which comes with either rigid or adjustable bridge. Standard 50-mm lenses are replaceable. Perforated side shields provide direct ventilation. A welder's model is identical, except for indirect ventilation and shaded protective lenses. (American Optical Co.)

For more data circle No. 59 on postcard, p. 133

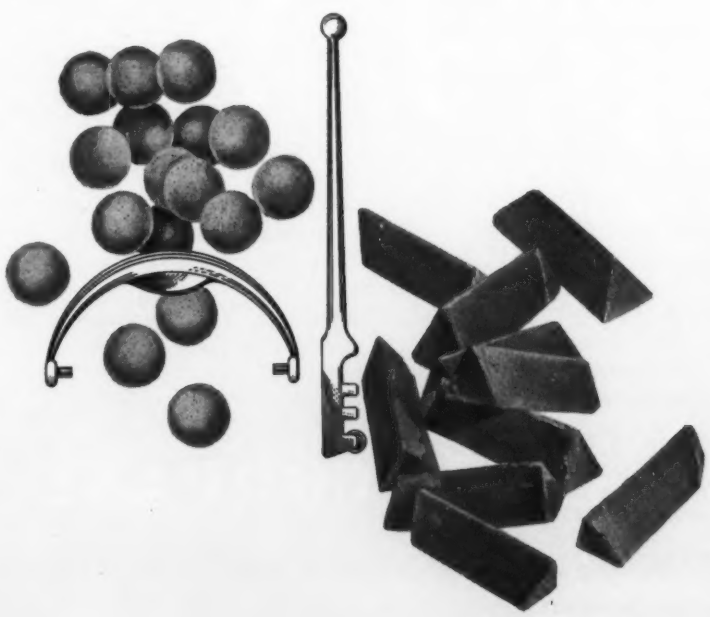
Switchgear Housing

A new all-aluminum housing for outdoor switchgear does away with the need for paint. Interlocking panel edges form leakproof joints and provide floor loading strength and wall rigidity. External surfaces reflect light, reducing internal heat, and directed air flow within keeps internal heat at a minimum. Concrete pier foundations would be adequate for such a housing, rather than an entire slab to support the base. (Allis-Chalmers Mfg. Co.)

For more data circle No. 60 on postcard, p. 133

Barrel Finishing is best finishing

...with TUMBLEX bonded abrasives*



Your sure way to cut finishing costs-per-piece is to combine the best barrel finishing techniques with the best abrasives. Norton can help you make the right choices.

Among the wide variety of Norton barrel finishing abrasives, bonded TUMBLEX abrasives are made of ALUNDUM* abrasive in four shapes — "T" triangles, "S" spheres, "TP" triangular pins, "RP" round pins. Available in many sizes, they provide fine, uniform finish, short-time cycles, long, even wear and sure savings on many finishing jobs.

Send samples of parts you finish to our Sample Processing Department. We'll barrel finish, return samples and report the methods and abrasives you need to improve quality and cut costs. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

G-380

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

CONVENIENCE

By merely picking up your phone and calling your Steel Service Center, you can order for immediate delivery exactly the steel you need.

It's as easy as super-market shopping because your Steel Service Center stocks every type of steel and will process your order to fit your production schedules. You can save on inventory investment and storage space, too.

Alan Wood supplies major Steel Service Centers with a variety of top-quality steel products. Your nearest Steel Service Center is listed in the Classified Telephone Directory.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN - PENNSYLVANIA

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The Iron Age Summary

Priorities Help Confuse Orders

Defense contractors are trying to push for extra tonnage under BDSA ruling while T-H injunction lasts.

Shipments of some products are suffering from lack of ingots. Most products will be on allocation through the first half of 1960.

▪ Defense industries are pushing hard to get as much steel as they can before the Taft-Hartley injunction runs out Jan. 26.

Basis for the defense demands is a recent Business and Defense Services Administration directive. It gives certain defense industries the right to demand prompt delivery and tonnage in excess of regular setasides.

Tonnage involved is difficult to estimate. But some dislocation of civilian orders of alloy steels, plates, and structurals will result from defense priorities.

Mixed Effects—This means key defense industries should be able to build up at least a cushion of steel inventories in case the Steelworkers renew their strike after the 80-day injunction comes to an end.

Effects of the defense priorities are mixed, ranging from severe interruption of scheduling to only a minor factor.

One steel sales executive reports that "six months tonnage requirements are being shoved into the 80-day period."

But another reports that most defense orders are "one-shot deals," and not much in the way of a regular buying pattern develops. Therefore, there is limited opportunity for a defense contractor to load up for several months ahead.

Quotas Enforced—On the overall market, the squeeze is on for almost all products. Allocation is the rule and will be probably continue through the entire first half of next year. Some early shipments based on orders placed before the strike have led to belief that some mills are not allocating on an equitable basis.

But while these may be minor exceptions, mills are doing their best to straighten out their deliveries. Another point leading to confusion: Not all mills are using the same method, and confusion is building up in some purchasing departments.

Shipping Problems — Problems in maintaining shipments are creeping into the picture. Many bar mills are operating only 12 to 13 turns a week. Hopes for an early easing in bar supply are waning.

Even wire and nails are joining the list of tight products. This is due in part to mill allocation of ingots and semi-finished steel. The picture is unchanged on sheets, strip, plates and structurals.

On the labor front, there is no reason for optimism as talks with Federal mediators resume in Washington this week. The stalemate is as serious as ever, with no sign of either side easing in its position. Instead, the Steelworkers appear determined to ride out the injunction and hope for Federal action.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,632	Last Week 2,547	Month Ago 368	Year Ago 1,985
Ingot Index (1947-1949=100)	163.9	158.6	22.9	123.6
Operating Rates				
Chicago	91.0	87.0	5.0	85.0
Pittsburgh	93.0	92.0*	4.0	69.0
Philadelphia	100.0	98.0*	12.0	68.0
Valley	87.0	86.5*	10.0	52.5
West	87.0	77.5*	16.0	82.0
Cleveland	91.0	87.0*	0.0	70.0
Detroit	95.0	92.0*	24.0	95.0
Buffalo	105.0	100.0	0.0	66.0
South Ohio River	100.0	97.5*	86.0	80.0
South	87.0	83.0	12.5	62.5
Upper Ohio River	92.0	94.0*	57.0	84.5
St. Louis	103.0	101.0*	93.0	83.0
Aggregate	93.0	90.0	13.0	73.5

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$43.50	$44.17	$46.17	$40.17
No. 2 bundles	$29.83	$30.50	$31.50	$28.33
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.80
Copper, electrolytic	33.00	33.00*	30-31.50	29.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	100.00	100.75	101.25	99.25
Zinc, E. St. Louis	12.50	12.50	12.50	11.50

How Conveyor Designs Change

Conveyor layout and design call for more specialized skills today.

It's all part of the trend toward more automatic control, more continuous flow of raw materials and finished products.

▪ Industrial conveyor design has changed since most of work was done by mechanical engineers and structural designers.

Walk into a conveyor design section today and you'll see a variety of talents being used. Completed drawings will show the work of electrical and electronics engineers, production engineers and materials handling specialists.

Cost Pressure—This reflects the trend to more automatically controlled, continuous flow handling systems. They are designed to give the user better production and lower cost distribution.

Rising emphasis on cost has put the spotlight on efficient distribution systems. This, in turn, has put greater emphasis on conveyor systems.

Standards Popular—More conveyor buyers are discovering the advantages of standardized unit assemblies. With these the buyer gets faster delivery, speedier assembly at the job and often lower final costs. Companies with bulk handling and package handling problems are often turning to standard conveyor assemblies.

Other new conveyor developments include the use of television and radio systems. With closed circuit TV, an operator can see what is happening at any critical point in a conveyor system. Through a series of monitors he can (in effect) be in several places at one time. Monitors can even be located at points where an operator cannot otherwise obtain a view.

Radio Control — Radio is also playing an increasing role. One manufacturer uses a radio transmitter to report the depth of material in a pile or bin. The same radio can be connected with controls to keep the material up to a pre-determined level. With radio and TV, the factor of distance is not a handicap in conveyor systems.

Currently, conveyor makers are revising their estimates about 1959. The steel strike and the effects of tight money have temporarily dulled the market to a degree. But through the first nine months new orders were slightly above shipments.

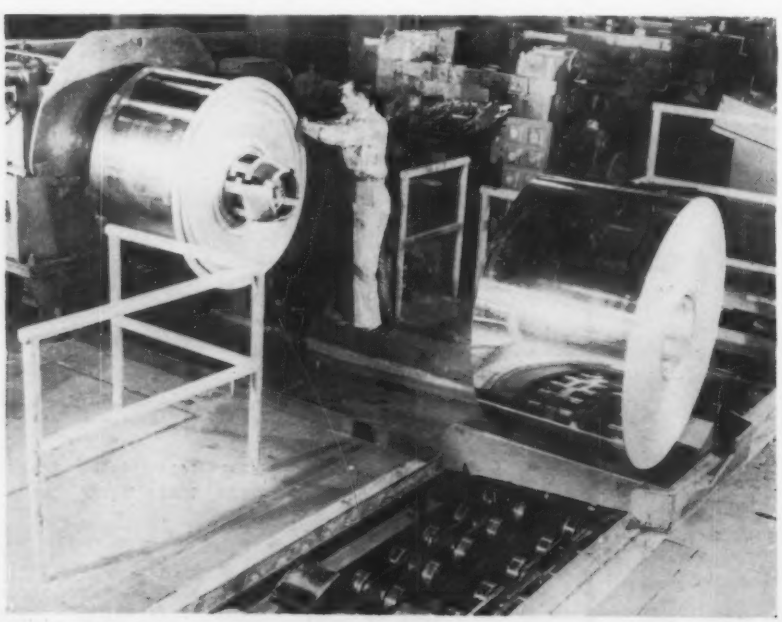
Revised Estimate—Originally it was estimated by industry sources that shipments in '59 might be $310 million. That would not have been far below the all-time record of 1957—about $370 million. Now estimates for this year center around $295 million.

But conveyor makers are optimistic. Sales are still running above 1958 totals. Backlogs are higher than they were a year ago. Even so, buyers can count on good deliveries (metal supplies permitting).

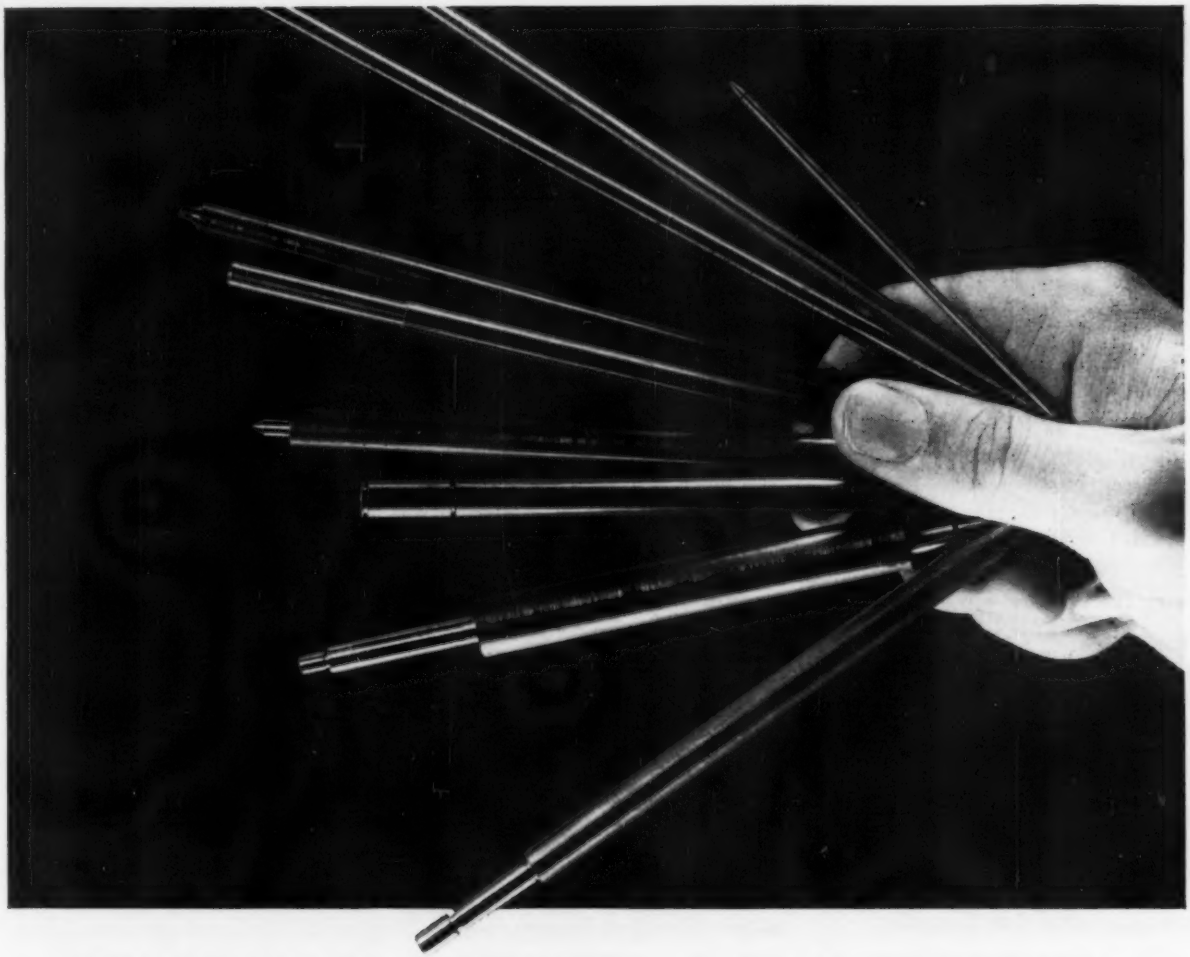
Concern About Prices — Most conveyor builders surveyed by The IRON AGE are doubtful about the price outlook. Sample comments include these:

"The price trend depends on our costs of material and labor. If these show increases, we may have to raise prices."

"Prices are unsteady—we will have a tough time absorbing any cost increases due to steel price rises."



BIG SHARE: Handling costs are a sizable portion of steel production costs. For that reason, conveyors are designed to help steelmakers lower costs and improve worker safety. (Link-Belt Co. photo)



Which will inspect these shafts faster... mechanical or optical gaging?

Over 25 different metal shafts go into the calculators made by Monroe Calculating Machine Company.

In the past, inspection of these shafts required the use of a large number of "go" and "no-go" gages. Rate? *About 7 per minute.* In addition, gage surveillance was both time-consuming and expensive.

Then the switch was made to optical gaging, using a Kodak Contour Projector. The method is simple: A master shaft is positioned to either upper or lower tolerance limits on the screen. Then the part to be inspected is placed in the same position.

Rate with optical gaging? *About 17 per minute!* And, there's no longer a need to send gages back to the crib for resetting. One Kodak Contour Projector does the whole job.

Besides saving time, optical gaging with a Kodak Contour Projector offers you a chance to *cut* down on gage costs, use operators with little or no training, and often obtain accuracy *not* possible by other means.

Where can you use optical gaging? Almost *anywhere* in the plant—receiving, assembly, production, final inspection, toolroom.

Facts about Kodak Contour Projectors are spelled out in a brochure which you can get by writing to the address below. After you've had a chance to look over the contents of the book, we'd like to demonstrate *why* and *how* one of the six Kodak models will best fit your inspection needs.

Use of low-cost Model 8 Kodak Contour Projectors enabled the Monroe Calculating Machine Co., a division of Litton Industries, to more than double inspection rates.

Special Products Sales

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

the KODAK CONTOUR PROJECTOR

Kodak

Order Rescheduling Brings Confusion

Steel sales offices are reviewing orders on the books and trying to give them definite shipping dates.

But, with various systems used, buyers are often puzzled with the results.

▪ Steel sales offices are wading through mounds of paperwork. The job: Analyzing orders and trying to give them realistic delivery dates.

Different mills approach the problem differently. Some stick to the original entry date on the orders. So July or August tonnage is rescheduled for December. September tonnage is earmarked for January or February delivery. And so on.

Other mills quote delivery in terms of so many months after operations resumed. Still others use weeks rather than months to calculate new shipping dates. As a result, buyers often remain confused.

Anxious Buyers — Meanwhile, users keep bombarding the mills with questions about deliveries. "There's practically a steady stream of calls, questions and complaints," says one sales manager. "Every customer wants more tonnage than ordered and delivery sooner than scheduled."

Some buyers are concerned, mills say, because other plants are getting steel before they do. "They forget," says a mill spokesman, "that they received tonnage in July and the other buyers didn't. These orders are the ones that stayed on the loading dock when the strike began. Now they're going out first."

Sheet and Strip — Mills believe there's little hope of catching up with users' needs for about seven months. They estimate it will be the end of February before shipments will pull even with consumption. After that the big job of rebuilding inventories will start.

Sheet mills which went down because of the strike say they have six months worth of orders on the books. Owners coming in now for hot-rolled, cold-rolled and galvanized sheet are given May delivery dates.

Plates and Shapes—Heavy steel producers are wondering how much defense priorities will scramble the delivery picture (see The IRON AGE Summary, p. 153). One **Pittsburgh** plate mill sizes up the delivery situation this way: July and August tonnage will be shipped during November, December, and January. Some September orders will carry over into February. An **East Coast** plate mill has orders booked through next May.

Pipe and Tubing—Mills are turning out small diameter pipe in good supply. Customers are pushing hard for delivery before the Taft-Hartley injunction runs out. At some mills large diameter welded pipe is booked out through June. Oil country goods remain in slow demand. Reasons include: The slowed-down oil drilling program, and a log jam of applications for natural gas pipelines pending at the Federal Power Commission.

Alloy and Stainless—Production by integrated producers is at strong levels. Demand remains good with automotive grades popular. But beyond those grades some mill backlogs extend out only 2½ to three months. Advance orders are not as heavy as in carbon steel products. One reason: About 35 pct of stainless capacity was operating during the strike.

Wire Products — Mills probably won't have any chance to pile up inventories this winter for the spring rush. Because of strike-accumulated demand, they will be busy reducing backlogs. Even mail orders are heavy. One **Eastern** mill has bookings three months ahead.

Supply sources of foreign rod have dried up. Users can't get delivery before February. Some who had been converting imported rod into wire and merchant products are switching back to U. S. suppliers, if they can.

Pig Iron—Demand still continues relatively light. Because many producers operated during the strike, supplies are adequate to cover buyer needs.

Bar—Orders from forgers, fastener makers, and others stay strong. Mill order books are full through the first quarter or beyond. Demand should remain ahead of supply through February at least.

Fabricated Steel — Shipments of fabricated structural steel through October this year were 20 pct below the same period in 1958. However, according to the American Institute of Steel Construction, bookings through October were 11 pct above the first ten months last year.

Total industry backlog as of Oct. 31 was 1,891,116 tons. More than 984,000 tons are scheduled for fabrication before the end of February.

PURCHASING AGENT'S CHECKLIST

Steel output should reach a new record next year. P. 67

U. S. Steel unveils a new alloy—Strux—said to have about 7 pct greater strength to weight than other constructional steel alloys. P. 69

Why changes in depreciation laws are needed. P. 81

COMPARISON OF PRICES

(Effective Dec. 1, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Dec. 1 1959	Nov. 23 1959	Nov. 3 1959	Dec. 1 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Dec. 1 1959	Nov. 23 1959	Nov. 3 1959	Dec. 1 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.50*	$45.50	$47.50	$42.50
No. 1 steel, Phila. area	44.50	44.50	46.50	34.50
No. 1 steel, Chicago	41.50*	42.50	44.50	43.50
No. 1 bundles, Detroit	41.50*	44.50	41.50	34.00
Low phos., Youngstown	48.50*	51.50	49.50	43.50
No. 1 mach'y cast, Pittsburgh	55.50	55.50	55.50	51.50
No. 1 mach'y cast, Phila.	54.50	54.50	53.50	49.50
No. 1 mach'y cast, Chicago	62.50*	63.50	64.50	53.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$43.50*	$44.17	$46.17	$40.17
No. 2 bundles	29.83*	30.50	31.50	28.33
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00**	30-31.50	29.00
Copper, Lake, Conn.	33.00	33.00	31.50	29.00
Tin, Straits, N. Y.	100.00†	100.75	101.25	99.25
Zinc, East St. Louis	12.50	12.50	12.50	11.50
Lead, St. Louis	12.80	12.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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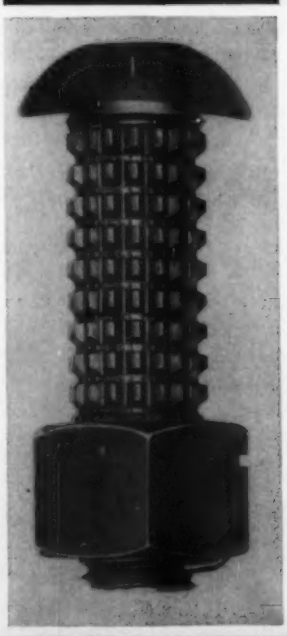

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Prices Drop Again In Major Districts

Further price drops of $1 to $2 were recorded in major scrap consuming areas for the second week.

However, the trade hesitates to say there has been a break in the market as tonnages involved in sales are still relatively small.

▪ Scrap prices broke further this week in major steelmaking centers. But the question remains whether the lower prices constitute an actual break in the market.

Most reports indicate tonnages moving at the lower prices are small. And the orders themselves are small. Trade sentiment leans toward the belief that the new prices are close to the market bottom.

While there is a greater willingness on the part of dealers to move scrap at current prices, many are holding on to stockpiles. It is still probable that any large mill purchases will cause prices to quickly rebound.

A weakening has been noted in the export market, causing prices for some grades to slide. First quarter schedules for export are still unknown, but good orders would likely restore strength to the market.

Pittsburgh — The market here slipped another notch as early industrial lists confirmed the general weakness. Small mill purchases also reflected a lack of price strength. There isn't enough new buying to peg price levels clearly, but the limited demand of the past few weeks apparently can be met at reduced prices. Scrap men do not see a complete price break. They see prices stabilizing near present levels and rebounding sharply if the mills come in with tonnage orders.

Chicago — Scrap slipped again, showing declines of $1 to $2 on small volume sales. Mill resistance and offers at lower prices continue to move scrap. Volume appears to be sinking, however, and dealers report yard collections are declining below the low levels hit in November. Large yard reserves are being withheld from the market. Low phos 2 ft and under was incorrectly quoted at $49 to $50 last week. It should have been $52 to $53.

Philadelphia—Scrap prices in this market broke late last week, but the changes came too late to be noted in the comments. However, they were included correctly in the price section — including the composites. There were no new orders this week, but prices for some grades underwent adjustment.

New York — Export orders followed domestic buying downwards. Steelmaking grades are off $2 per ton, while turnings fell $1. Cast grades are down $2 per ton on appraisal in expectation of new orders from pipe foundries at lower prices later this week.

Detroit—Prices slipped this week as mills continued to show little interest in scrap. There were small flurries, but no big orders were reported. Mills are still digging into their huge inventories. There is a feeling the market may soften a bit more.

Cleveland — Valley electric furnace scrap lost its premium from competition with conversion orders as market softened for lack of a substantial mill order. Prices dropped $2 to $3 to the level of openhearth grades. Local auto lists for December went for $2 under quoted prices.

St. Louis—A weaker tone prevails in the scrap steel trade here. Trading is quiet. More scrap is being offered than mills are willing to buy and this has forced some prices down.

Cincinnati—The market declined $2 in sympathy with other areas, but there is hope of new orders. Major area mills are expected to come into the market. Upriver shipments are going ahead on old orders, but no new ones have been reported lately.

Birmingham—Brokers and most dealers agree the scrap market is weak. But the few purchases made this week mostly were at unchanged prices, although cast grades were off $1 per ton. A large Birmingham electric furnace indicated it will buy next week at reduced prices.

Buffalo — Inactivity has settled over the market here and prices remain unchanged. Dealers feel that any new sales would be at current prices. Scrap still is coming into this port via the Great Lakes, but in diminishing amounts so the shipping season draws close to an end.

Boston — There's little activity evident in the market and most prices remain unchanged as the trade waits for something to happen. However, cast prices have strengthened, while turnings have eased.

West Coast—Prices for top steelmaking grades dropped $1 per ton in Los Angeles. San Francisco is unchanged. Export orders for the first quarter of 1960 are due soon. If they are good, the market is likely to firm.

Houston—The market is in the doldrums and is showing some weakness. Brokers see no encouragement in the near future.

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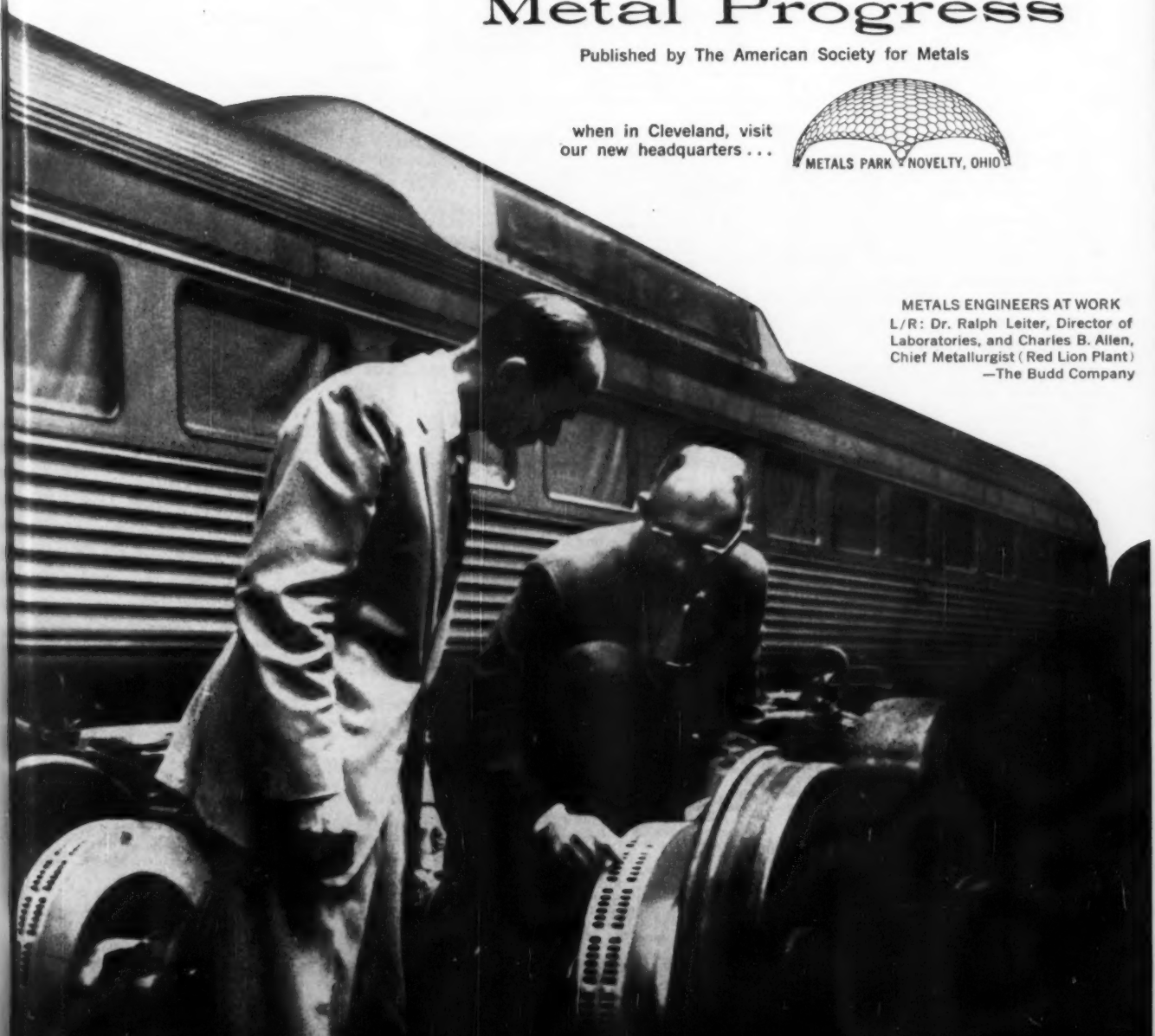


METALS ENGINEERS AT WORK
L/R: Dr. Ralph Leiter, Director of Laboratories, and Charles B. Allen, Chief Metallurgist (Red Lion Plant)
—The Budd Company

Other ASM Activities: METALS REVIEW • METAL SHOWS • METALS ENGINEERING INSTITUTE • METALS HANDBOOK • TRANSACTIONS • TECHNICAL BOOKS

SCRAP PRICES *(Effective Dec. 1, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	28.00 to 29.00
Low phos. punch'gs plate	54.00 to 55.00
Heavy turnings	38.00 to 39.00
No. 1 RR hvy. melting	50.00 to 51.00
Scrap rails, random lgth.	61.00 to 62.00
Rails 2 ft and under	68.00 to 69.00
RR specialties	59.00 to 60.00
No. 1 machinery cast.	55.00 to 56.00
Cupola cast.	51.00 to 52.00
Heavy breakable cast.	49.00 to 50.00
Stainless	
18-8 bundles and solids	235.00 to 240.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	41.00 to 42.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. forge crops	56.00 to 57.00
Low phos. punch'gs plate, ¼ in. and heavier	53.00 to 54.00
Low phos. 2 ft. and under	51.00 to 52.00
No. 1 RR hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	55.00 to 57.00
Rerolling rails	63.00 to 64.00
Rails 2 ft. and under	62.00 to 63.00
Angles and splice bars	55.00 to 56.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	62.00 to 63.00
Cupola cast.	55.00 to 56.00
Cast iron wheels	49.00 to 50.00
Malleable	63.00 to 64.00
Stove plate	50.00 to 51.00
Steel car wheels	53.00 to 54.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	24.00 to 25.00
Mixed bor. short turn.	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	27.00 to 28.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	49.00 to 50.00
Low phos. 2 ft punch'gs	51.00 to 52.00
Elec. furnace bundles	49.00 to 50.00
Heavy turnings	34.00 to 35.00
RR specialties	50.00 to 51.00
Rails 18 in. and under	67.00 to 68.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	47.00 to 48.00
Cast iron car wheels	50.00 to 51.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	54.00 to 55.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. and under	49.00 to 50.00
Rails, random length	55.00 to 56.00
Rails, 18 in. and under	63.00 to 64.00
No. 1 cupola cast.	49.00 to 50.00
Hvy. breakable cast.	44.00 to 45.00
Drop broken cast.	59.00 to 60.00

Youngstown

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	21.50 to 22.50
Shoveling turnings	26.50 to 27.50
Low phos. plate	48.00 to 49.00

Cleveland

No. 1 hvy. melting	$43.50 to $44.50
No. 2 hvy. melting	35.50 to 36.50
No. 1 dealer bundles	43.50 to 44.50
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	26.50 to 27.50
No. 1 busheling	43.50 to 44.50
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Cut structural & plates, 2 ft & under	50.00 to 51.00
Drop forge flashings	43.50 to 44.50
Low phos. punch'gs plate	44.50 to 45.50
Foundry steel, 2 ft & under	44.50 to 45.50
No. 1 RR hvy. melting	47.50 to 48.50
Rails 2 ft and under	65.00 to 66.00
Rails 18 in. and under	66.00 to 67.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	60.00 to 61.00
No. 1 machinery cast.	56.00 to 57.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	225.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	39.00 to 40.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	21.00 to 22.00
Low phos. plate	44.00 to 45.00
Structurals and plate, 2 ft and under	45.00 to 46.00
Scrap rails, random lgth.	43.00 to 44.00
Rails 2 ft and under	53.00 to 54.00
No. 1 machinery cast.	53.00 to 54.00
No. 1 cupola cast.	49.00 to 50.00

St. Louis

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	25.00 to 26.00
No. 1 RR hvy. melting	46.00 to 47.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	58.00 to 59.00
Angles and splice bars	50.00 to 51.00
RR specialties	51.00 to 52.00
Cupola cast.	53.00 to 54.00
Heavy breakable cast.	45.00 to 46.00
Stove plate	45.00 to 46.00
Cast iron car wheels	48.50 to 49.50
Rerolling rails	64.00 to 65.00
Unstripped motor blocks	45.00 to 46.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	42.00 to 43.00
Elec. furnace, 3 ft & under	40.00 to 41.00
Bar crops and plate	47.00 to 48.00
Structural and plate, 2 ft.	46.00 to 47.00
No. 1 RR hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	53.00 to 54.00
Rails, 18 in. and under	57.00 to 58.00
Angles and splice bars	49.00 to 50.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast.	54.00 to 55.00
Stove plate	54.00 to 55.00
Cast iron car wheels	45.00 to 46.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.00 to 33.00
No. 2 dealer bundles	21.00 to 22.00
Machine shop turnings	10.00 to 11.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	37.00 to 38.00
Heavy breakable cast.	37.00 to 38.00
Stainless	
18-8 prepared solids	200.00 to 205.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	22.00 to 23.00
No. 1 bushelings	39.00 to 40.00
Drop forge flashings	39.00 to 40.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	23.00 to 24.00
Heavy breakable cast.	41.00 to 42.00
Mixed cupola cast.	48.00 to 49.00
Automotive cast.	53.00 to 54.00
Stainless	
18-8 bundles and solids	205.00 to 210.00
18-8 turnings	80.00 to 85.00
430 bundles and solids	100.00 to 105.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	18.50 to 19.50
No. 1 machinery cast.	43.00 to 44.00
Mixed cupola cast.	40.00 to 41.00
Heavy breakable cast.	37.00 to 38.00

San Francisco

No. 1 hvy. melting	....	$40.00
No. 2 hvy. melting	....	36.00
No. 1 dealer bundles	....	36.00
No. 2 bundles	....	22.00
Machine shop turn.	$17.00 to	19.00
Cast iron borings	17.00 to	19.00
No. 1 cupola cast.	....	47.00

Los Angeles

No. 1 hvy. melting	....	$40.00
No. 2 hvy. melting	....	38.00
No. 1 dealer bundles	....	37.00
No. 2 bundles	....	21.00
Machine shop turn.	$18.00 to	19.00
Shoveling turnings	18.00 to	19.00
Cast iron borings	18.00 to	19.00
Elec. furn. 1 ft and under (foundry)	49.00 to	50.00
No. 1 cupola cast.	47.00 to	48.00

Seattle

No. 1 hvy. melting	....	$35.00
No. 2 hvy. melting	....	33.00
No. 2 bundles	....	22.00
No. 1 cupola cast.	....	36.00
Mixed yard cast.	....	36.00

Hamilton, Ont.

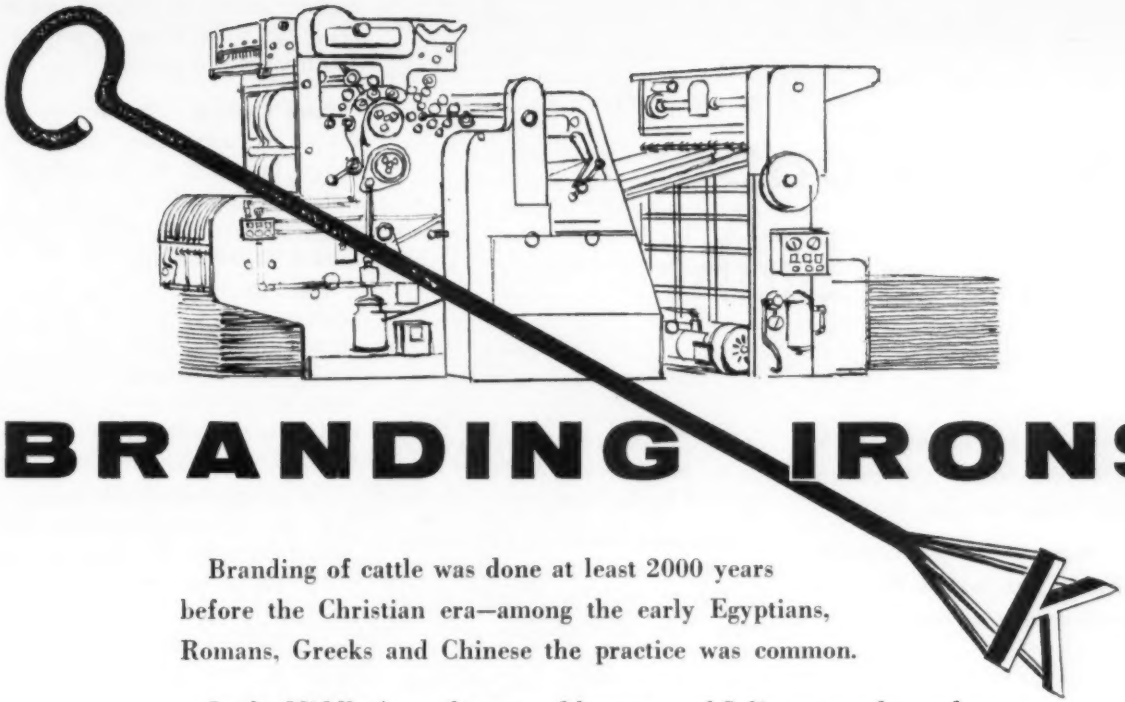
Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$32.25
No. 2 hvy. melting	....	28.25
No. 1 dealer bundles	....	32.25
No. 2 bundles	....	24.00
Mixed steel scrap	....	24.25
Bush., new fact., prep'd.	....	32.25
Bush., new fact., unprep'd	....	26.25
Machine shop turn.	....	14.00
Short steel turn.	....	17.00
Mixed bor. and turn.	....	13.00
Rails, rerolling	....	37.00
Cast scrap	$46.50 to	48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	31.00
No. 2 bundles	....	20.00
Machine shop turn.	....	16.00
Shoveling turnings	....	20.00
Cut structural plate 2 ft & under	$48.00 to	49.00
Unstripped motor blocks	39.50 to	40.50
Cupola cast.	46.00 to	47.00
Heavy breakable cast.	34.00 to	35.00



BRANDING IRONS

Branding of cattle was done at least 2000 years before the Christian era—among the early Egyptians, Romans, Greeks and Chinese the practice was common.

In the Middle Ages, the crossed hammers of Solingen was burned on animals and stamped on swords; and from about 1350, the British Imperial Brand appeared on live stock, on lances, rifles and other equipment.

Hernando Cortez brought the first branding iron to the New World—he would not have time to mine, smelt and shape American metal into a stamping iron. In 1540 Coronado had branded cattle with him as he roamed the Southwest in his search for treasure.

Today, brands still identify livestock and small arms—but for the far greater job of branding countless foods, drugs, tobacco, beverages and other products, billions of labels roll off thousands of printing press "branding irons." For these, and countless other machines constructed of iron and steel, a never-failing supply of scrap must be available.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M. S.
KAPLAN
COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

End of Copper Strike in Sight

It won't be long before the U. S. coppermakers will be operating close to capacity.

The Kennecott - Steelworkers settlement has forced the issue in other copper strikes.

■ It shouldn't be long before the U. S. copper industry is producing close to capacity.

There are still some trouble spots. But generally, the Kennecott settlement with the Steelworkers is forcing the issue in other strikes, and in many cases setting the pace.

Mine Mill Follows—Late last week American Smelting and Refining Co. came to agreement with the International Union of Mine, Mill and Smelter Workers. The union pegs the package at 22.4¢ over the next 20 months. Kennecott's Steelworker pact is put at 22.3¢ over 20 months.

The difference, if there really is one, is hair-splitting. No two contracts in copper will be the same because of varying local situations. Some sources say this is merely an attempt by Mine, Mill to make it appear it outbargained the Steelworkers.

Next Steps — Mine, Mill locals will likely come to agreement with Phelps Dodge and Kennecott soon.

They have been offered the same pact the Steelworkers got, and are agreeable to the wage and fringe hikes.

At Kennecott the big issue is the no-strike clause the company wants (and got with Steelworkers). Mine, Mill wants to retain the right to strike on a grievance not directly covered by the contract.

Anaconda Resists — The strikes at Anaconda's Montana operations are likely to be the toughest to settle. The company, to date, is sticking to its guns that this area is largely marginal, and therefore it can't match the terms that are prevailing in the industry. The last announced offer was about 6.7¢ per year increase in wages and benefits for one, two or three years.

Anaconda has been shifting the emphasis to its Chilean operations in the last decade. Now it is doing everything possible to bring this point home. Anaconda recently opened one of the biggest copper mines in the world in Chile. Now more than two-thirds of its normal output will come from Chile.

Not Hurting—To further point out the fading importance of the Montana operation in long range company plans, it's noted that Anaconda bumped its quarterly dividend to $1 for the third quarter, when U. S. operations were strikebound.

It had been 50¢ since the first quarter of 1958. It was $1 through the big earnings of 1957 and dropped to 75¢ in the last quarter of that year when the recession started to be felt.

With benefit of hindsight: The USW had two factors working for it in its talks with Kennecott. (1) Kennecott is generally conceded to be the lowest-cost U. S. producer, and (2) the company's leadership is acutely aware of the long-term damage an overly inflated copper price can do in terms of competition from other materials.

Price Outlook — It now appears the U. S. copper price was about poised for flight to the high 40's and maybe even to 50¢ per lb for spot metal if the strikes hadn't started breaking when they did.

There can be no doubting Kennecott's attitude on price. It doggedly refused to budge over 30¢ per lb through the whole strike, even when other producers went to 33¢ and traders were easily getting 38¢ to 40¢ for metal delivered this year.

The company reacted to the pressure by withdrawing from the market on Nov. 12. Now that its strikes are about over it is back in the market at 33¢ per lb.

Tin prices for the week: Nov. 25 —100.50; Nov. 26—holiday; Nov. 27 — 101.50; Nov. 30 — 100.00; Dec. 1—100.00.*
*Estimate.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in NOVEMBER based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd Conn. Valley	32.50
Copper, Lake	32.75
Straits Tin, New York	100.986
Zinc, E. St. Louis	12.50
Lead, St. Louis	12.80
Aluminum ingot	26.80

Note: Quotations are on going prices

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.80	26.10	8/1/58
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	30.00	9/1/59
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	12.80	11.80	8/24/59
Lead, N. Y.	13.00	12.00	8/24/59
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/58
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	12.50	12.5-13	11/2/59
Zinc, N. Y.	13.00	13-13.5	11/2/59

ALUMINUM: 99% ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 164.

FOOTE
MINERAL COMPANY

The joker in making aluminum killed steels is the 7¢ per pound you're *supposed to be saving* by using manganese alloys instead of pure electrolytic manganese. Sure, the *manganese* in the alloys is cheaper . . . BUT it's the *impurities* that cost you money . . . in lower product quality and in longer furnace time. By using pure manganese you improve the ductility of your steel . . . lower reject levels . . . and simplify furnace and deoxidation practices.

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7 cent JOKER IN ALUMINUM KILLED STEELS

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250-3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-½	¾-1	1¼-1½
Price	62 0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	103	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Munts Metal	53.20	.....	48.26	.....
Comm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77 44	.....	78.19	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.75-$6.25; alloy, $7.75-$10.00; Bar, HR or forged, commercially pure, $4.25-$5.00; alloy, $4.25-$7.50; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.40
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb).... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 33.30 to 42.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $215 to $217
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz... $20 to $22
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.75
- No. 120 ..... 29.25
- No. 123 ..... 28.75

80-10-10 ingot
- No. 305 ..... 35.25
- No. 315 ..... 33.00

88-10-2 ingot
- No. 210 ..... 44.00
- No. 215 ..... 40.75
- No. 245 ..... 36.00

Yellow ingot
- No. 405 ..... 24.75

Manganese bronze
- No. 421 ..... 29.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.00-25.25
- 0.60 copper max. 24.75-25.00

Piston alloys (No. 132 type).. 26.75-27.75
No. 12 alum. (No. 2 grade)... 23.50-24.00
108 alloy 24.00-24.50
195 alloy 26.50-27.50
13 alloy (0.60 copper max.)... 24.75-25.00
AXS-679 (1 pct zinc) 23.75-24.75

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 24.00-25.00
- Grade 2—92-95% 22.75-23.75
- Grade 3—90-92% 21.75-22.75
- Grade 4—85-90% 21.25-22.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26¼	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29¼
- No. 2 copper wire 25¾
- Light copper 23½
- *Refinery brass 24
- Copper bearing material 23

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29¼
- No. 2 copper wire 25½
- Light copper 23½
- No. 1 composition 23
- No. 1 comp. turnings 22¼
- Hvy. yellow brass solids 16¾
- Brass pipe 16¼
- Radiators 18

Aluminum

- Mixed old cast. ..... 14 —15
- Mixed new clips ..... 16½—17
- Mixed turnings, dry ..... 14½—15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass
- No. 1 copper wire ..... 25 —25½
- No. 2 copper wire ..... 22 —22½
- Light copper ..... 20½—21
- Auto radiators (unsweated). 14½—15
- No. 1 composition ..... 18½—19
- No. 1 composition turnings... 17 —17½
- Cocks and faucets ..... 15 —15½
- Clean heavy yellow brass ... 13 —13½
- Brass pipe ..... 15 —15½
- New soft brass clippings .... 15¼—15¾
- No. 1 brass rod turnings .... 12½—13

Aluminum
- Alum. pistons and struts .... 7½— 8
- Aluminum crankcase ..... 11¼—11¾
- 1100 (2s) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11¼—11¾
- Borings and turnings ..... 7 — 7½
- Industrial castings ..... 11¼—11¾
- 2020 (24S) clippings ..... 12½—13

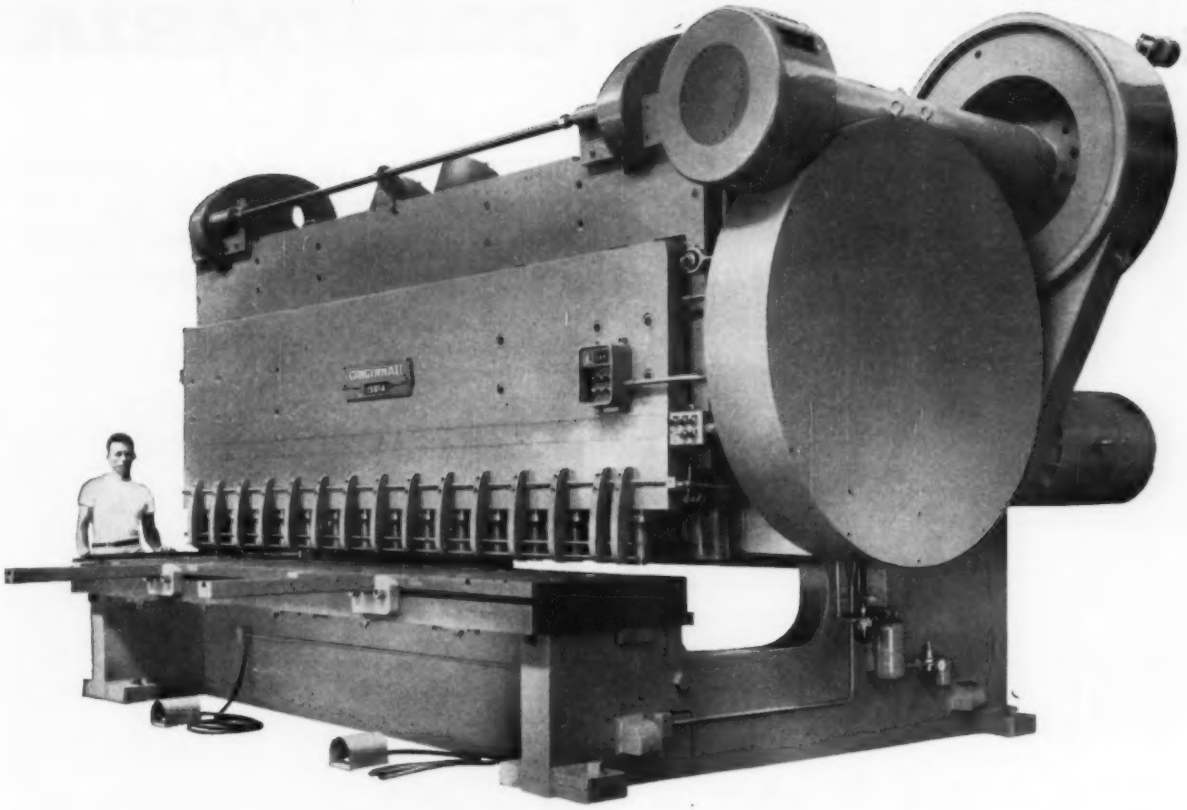
Zinc
- New zinc clippings ..... 6¼— 6¾
- Old zinc ..... 4¼— 4¾
- Zinc routings ..... 3 — 3¼
- Old die cast scrap ..... 2½— 2¾

Nickel and Monel
- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 30-32
- Clean Monel turnings 20-23
- Old sheet Monel 26-28
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed 15

Lead
- Soft scrap lead ..... 8¾— 9¼
- Battery plates (dry) ..... 4¼— 4½
- Batteries, acid free ..... 2½— 2¾

Miscellaneous
- Block tin ..... 77 —78
- No. 1 pewter ..... 59 —60
- Auto babbitt ..... 40 —41
- Mixed common babbitt ..... 9¾—10¼
- Solder joints ..... 14 —14½
- Siphon tops 42
- Small foundry type ..... 10¼—10¾
- Monotype ..... 10¼—10¾
- Lino. and stereotype ..... 9¼— 9¾
- Electrotype ..... 7¾— 8¼
- Hand picked type shells .... 6 — 6½
- Lino. and stereo. dross ..... 2¾— 3¼
- Electro dross ..... 2¾— 3¼

(Effective Nov. 30, 1959)



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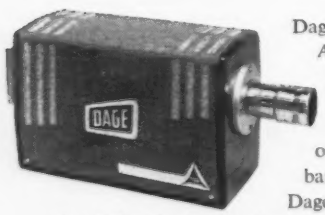

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6643 S. Narragansett Ave., Chicago 38, Ill.
SINCE 1910

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1; C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

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STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Coke* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

*Electrogalvanized sheets.

(Effective Nov. 30, 1959)

*7.425 at Sharon-Niles is 7.225

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Nov. 30, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Chicago, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass
R7 Rome Strip Steel Co., Rome. N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.50¢ per lb.

(Effective Nov. 30, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	2	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2

High-carbon chromium .. .955 D-3, D-5
Oil hardened manganese .505 O-2
Special carbon ..... .38 W-1
Extra carbon ..... .38 W-1
Regular carbon ..... .325 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A5, J2*) 10 pct	Plate (*L4, C4, A5, J2*) 15 pct	Plate (*L4, C4, A5, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	15.35
Cleveland *R3*	.....	.....	.....	.....	.....	.....
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I4*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	15.35
Kansas City *S2*	.....	.....	.....	10.10	.....	.....
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	.....	.....
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective Nov. 30, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	17½" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...		190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	173	190	177	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	17‹	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Chicago	.....	.....	.....	15.60	.....
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.50
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	48.25
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine ½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1¼" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

	Full case or Keg price
Nuts, Hex, HP reg. & hvy.	
⅝ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
C. P. Hex, reg. & hvy.	
⅝ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41
Semi-finished Hex Nuts	
⅝ in. or smaller	62
¾ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 65

Rivets *Base per 100 lb*

½ in. and larger $12.85

Pct. Off List

7/16 in. and smaller 15

Cap Screws *Discount (Packages)*

Full Finished H. C. Heat Treat

	Full Case
New std. hex head, packaged	

	C-1018 Steel Full-Finished Cartons	C-1018 Steel Full-Finished Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Discount Stove Bolts
Plain Finish		
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. 25,000-and over	60	..
5/16 to ½" diam. incl. 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Discount Square
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	46.00
Electrodeposited	38.50
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots	18.75
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium, 5000 lb	1.30
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.70
(Philadelphia price 25.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24				
Baltimore**	$.10	9.90	10.10	10.16	11.55	10.00	10.65	10.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		9.43	10.20	10.46	10.91	9.79	10.00	9.59	13.14	16.76			
Boston**	.10	10.52	11.27	11.82	12.17	10.42	10.72	10.34	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.80	10.50	11.35	11.30	10.25	10.40	9.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.69	10.35	11.10	10.35	8.62	9.16	8.79	10.80	17.10	16.10	19.70	20.45
Cincinnati**	.15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.69[1]	9.89	11.02	10.47	8.88	9.67	8.90	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit**	.15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	17.38	16.38	21.48	21.03
Houston**		9.65	9.65		10.85	9.65	9.35	8.90	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles**		9.95[1]	11.55	12.20	11.55	10.00	10.00	9.10	14.20	18.30	16.45	21.30	20.80
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11				
Milwaukee**	.15	8.83	10.49	11.24	10.49	8.76	9.30	8.93	11.04	17.24	15.34	21.24	19.89
New York	.10	9.27	10.59	11.45	9.74	9.87	9.84	10.09	13.35	16.16	15.00	20.10	19.35
Norfolk	.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.30	9.35	10.71	9.35	9.25	9.20	9.50	12.05	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.69	9.84	10.91	10.45	8.62	9.78	8.79	11.40	17.10	16.10	19.70	20.45
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30	18.50	17.45	20.75	20.25
San Francisco**	.10	11.00	11.95[2]	11.50	12.25	11.00	10.95	10.75	15.20	18.30	16.35	22.90	20.60
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	9.07	10.73	11.48	10.73	9.00	9.76	9.17	11.43	17.48	16.48	21.58	19.33
St. Paul**	.15	8.95	9.46	10.62	10.47	8.75	9.48	8.85	11.64		16.69		21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅜"; cold drawn—15/16" to 2⅜" round; Hot-rolled 4140—⅞" to 2⅜" round, cold drawn—15/16" to 2⅜" round.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter.

(Effective Nov. 30, 1959)

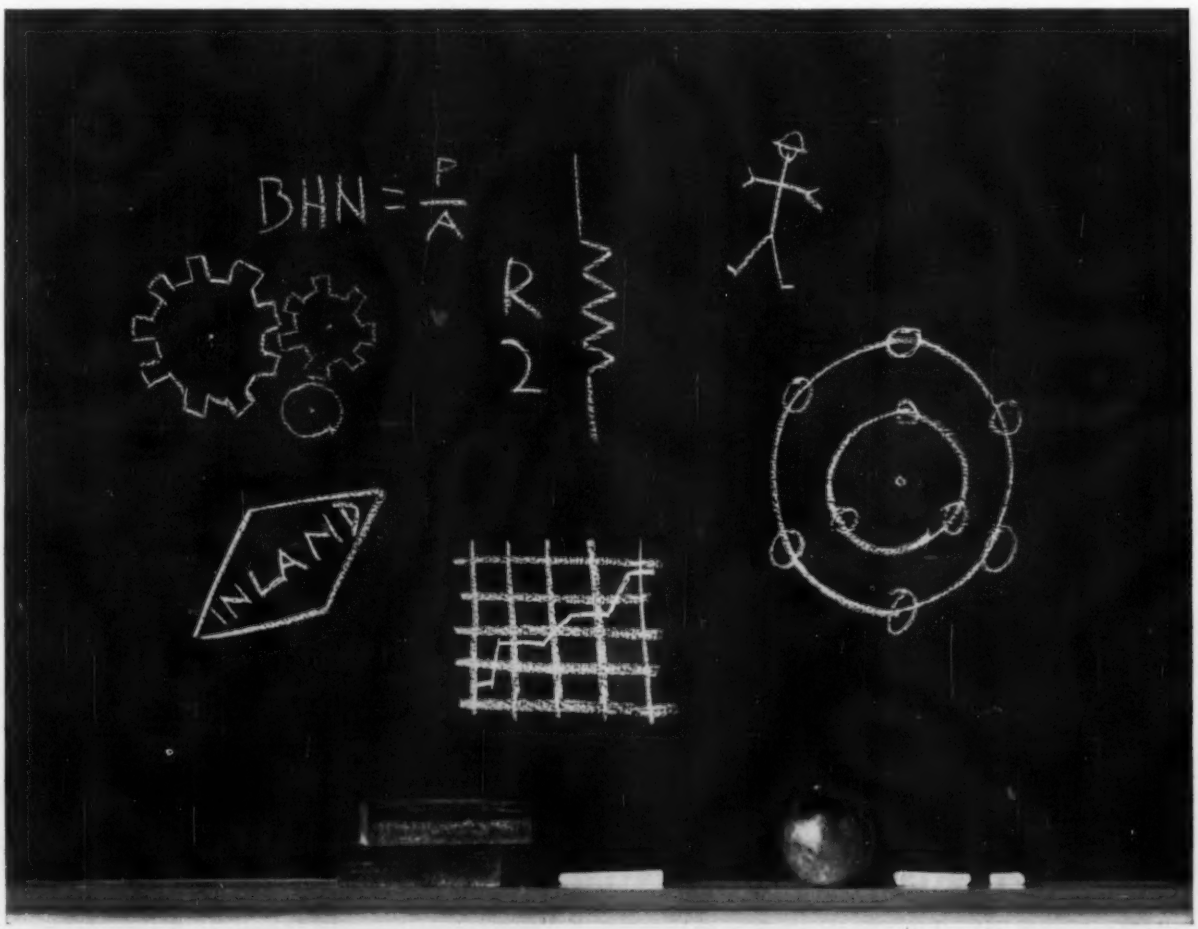
14,089 Inland employees went to school last year

Many went because they were enthusiastic about their jobs—inspired by the advancement opportunities at Inland. Others went because Inland, ever on the watch for men capable of developing their abilities, sought them out—found them—encouraged them to take the next step.

At Inland, this thoughtfully planned system of seeking for such men within the company, has now been in continuous operation for more than fifteen years. Because of it, more than 70% of Inland's supervisory staff have come up from the ranks—30% more from Inland's College Recruitment Program. Because the system encourages personal growth, the process never stops. It may begin with on-the-job training programs in which 3,842 employees participated last year. It can continue through Inland's programs in conjunction with leading educational institutions, such as Harvard, Purdue, University of Chicago and Wabash College.

With literally thousands of Inland men building their own futures, a new kind of climate is created—a climate in which men find real satisfactions in their work and the products of their labor. It results, we believe, in a growth-minded organization—a company dedicated to ever better service and products for every Inland Customer.

Building Today, with an Eye to Tomorrow



INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois
Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

Other Members of the Inland Family
JOSEPH T. RYERSON & SON, INC.
INLAND STEEL PRODUCTS COMPANY
INLAND STEEL CONTAINER COMPANY*
INLAND LIME & STONE COMPANY* *Division

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

(Ferroalloy prices will next appear in the Dec. 10 issue.)

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.80	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*, Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*; Reading, Pa., *C2*; Bridgeport, Conn., *N8*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Ambridge, Pa., *B7*; Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

(Effective Nov. 30, 1959)

C ELECTRIC FURNACE STEEL CASTINGS

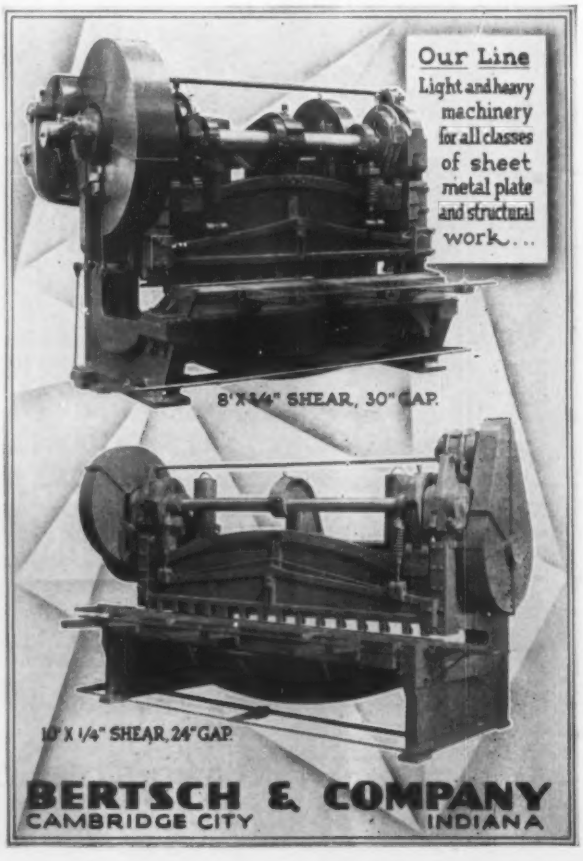
are engineered to *YOUR* specific requirements

"C" steel castings are CLEAN steel castings of uniform structure that will minimize machining and assembly costs, permit of greater freedom and efficiency of design and add to your product the recognized strength, endurance and desirability of steel. C steel castings, foundry engineered from pattern to finished casting can be had in

CARBON, ALLOY OR STAINLESS STEEL SAND OR SHELL MOULDED

The technical experience and knowledge of our engineering staff are at your service. Write, phone, or call.

CRUCIBLE STEEL CASTING CO.
LANSDOWNE 1, PENNA.


Our Line
Light and heavy machinery for all classes of sheet metal plate and structural work...
8' X 1/4" SHEAR, 30" GAP.
10' X 1/4" SHEAR, 24" GAP.

BERTSCH & COMPANY
CAMBRIDGE CITY INDIANA

"EVERYTHING HINGES ON HAGER!"®

We'll make **IT** for you! For standard (5,000 different types and sizes) or special hinges, write or wire: C. Hager & Sons Hinge Mfg. Co., Victor & "I" Street, St. Louis 4, Mo.
In Canada, Hager Hinge Canada Ltd., Kitchener, Ont.

HAGER HINGES

Founded 1849, Every Hager Hinge Swings on 100 Years of Experience

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For years of steady service—

ELECTROLIFT WORM-DRIVE HOISTS

- **Simple to operate**—one man control, push-button or rope
- **Built to last**—with quality parts and automatic lubrication
- **Safe**—alloy steel worm-drive brake holds loads securely
- **Compact**—no overhung gears . . . allow close headroom
- **Clean and quiet**—working parts are fully enclosed

ElectroLift worm-drive hoists give you smooth, fast control over loads of from ¼ to 10 tons. For details on speeds and models, consult your ElectroLift representative, listed in the classified directory.

WORM DRIVE ELECTROLIFT HOISTS

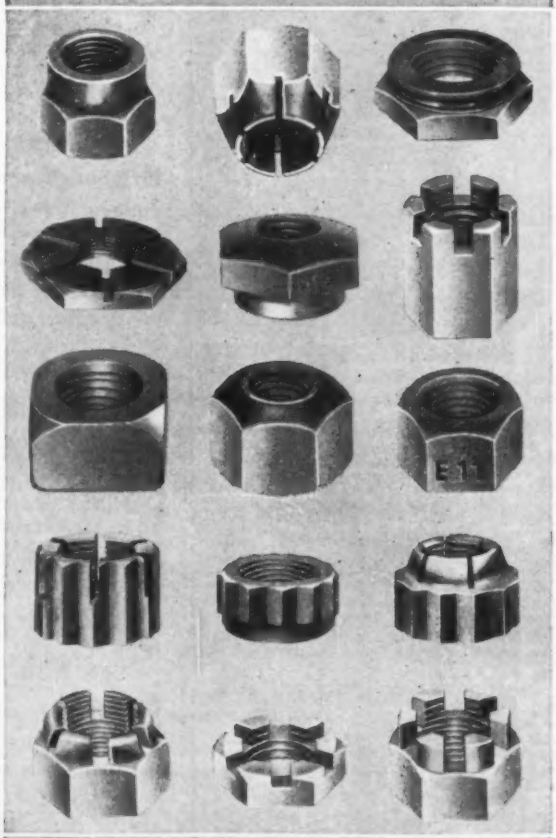
6456

204 Sargeant Avenue **Clifton, N. J.**

SPECIAL NUTS

to specs. 7/16"—4¼" cross flats

special machines + large stock of material × years of experience = speedy deliveries high quality low prices



Here are a few samples made to customers specifications . . Our batteries of special high-speed multi-spindle, automatic machines make possible fast and accurate production of hexagon nuts of non-standard height and special shape from carbon or alloy steel, Naval bronze or other non-ferrous metals; also AN 310 through AN 335 as per latest Airforce specifications. Very often the special nut you require may be similar to one we are already making and a simple modification would result in a price advantage and quicker deliveries to you . . Send us your blueprint and particulars —let us quote on your requirements . . We also have a catalog that contains complete specifications, engineering data and prices regarding our standard nuts.

Manufacturer of Standard and Special
12 Pointer, Square and Hexagon Nuts
. . . "Huglock" and "Conelock" locknuts.

NATIONAL MACHINE PRODUCTS COMPANY

an sps company 44250 UTICA ROAD UTICA, MICH

ELECTRICAL POWER
EQUIPMENT IN STOCK

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New Elliott	Enc. F.V.	475	320
1	3000	New Whse.	Enc. F.V.	525	600
2	2700	G.E.	MCF	415	230
1	2250	New Elliott	Enc. F.V.	600	200/300
1	2200	G.E.	MCF	600	400/500
2	2000	G.E.	MCF	350	230/350
2	1750	G.E.	MCF	250	175/350
4	1500	New Whse.	Enc. F.V.	525	600
2	1400	G.E.	MCF	250	165/300
1	1300	G.E.	MCF-12	300	300/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
1	940	Whse.	QM	250	140/170
2	940	S.S.	Enc. F.V.	600	800/1000
2	800	G.E.	MCF	250	400/750
2	765	Allis Ch.	MHC	550	1012/1350
2	750	G.E.	MCF	600	450/900
1	750	G.E.	M.F.	600	120/360
4	600	Whse.		250	275/550
1	500	G.E.	MPC-10	250	188/400
2	450	Whse.		350	415
2	400	G.E.	CY-275	300	1000/1500
2	325	Allis Ch.	MHC	250	450/900
1	300	Cr. Wh.	H-102 B.B.	230	1200
1	200	Rel. B.B.	T-664-D.P.	240	850
1	150	Cr. Wh.	CMC-65H	230	1150
1	150	G.E.B.B.	TLC-74	250	1150/3500
1	150	G.E.B.B.	CD	600	250/750
1	150	G.E.	CDP-125, B.B.	230	1750
1	150	A.C.	E.V.B.B.	250	450/1200
1	120	G.E.B.B.	TLC-50	250	1950/5000
1	120	Rel. B.B.	1050T	230	575/900
1	100	Whse.	8K-180	230	450/1100
1	100	G.E.	CDP-145	230	1750
1	80	Whse.	8K-123.9	240	2000/4500
1	75	G.E.B.B.	CD-1235-D.P.	600	850
1	60/75	Rel.	1050T	250	350/1050
1	30/40	Whse. B.B.	SK-131, TEFC	250	500/1500

MERCURY ARC RECTIFIERS

3—150 KW, G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.

2—150 KW, G.E., Ignitron, 245 V. D.C.—230 V. A.C. air cooler transformers with controls.

MG SETS—3 Ph. 60 CY.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1700	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	Cr.Wh. 4 unit	720	100	2300
1	500	G.G.	900	125/250	440
1	500	G.G.	900	250	2300/4600
1	500	G.E.	1200	300	2300
1	350	G.E.	900	125	440/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	250	G.E.	900	250	440/2300
1	240	Whse.	900	125	220/440
1	200	Whse.	1200	550	2200
1	200	El. Mhs.	1200	250	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	250	440
1	150	G.E.	1200	125	440
	140	Cr.Wh.	690	125/250	2300
1	100	G.E.	1170	250	220/440
2	100	Cr.Wh.	81160	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
3	1000	G.E.	CA/FA	1	13800 x 230/460
3	833	A.C.	OISC	1	4800/2400 x 480
1	750	Wagner	JPC-16	3	13200 x 480
2	750	G.E.	Pyranol	1	4800x85/55-255/165
3	500	Kuhl	OISC	1	13200 x 6600
3	150	G.E.	OISC	1	33000x2300/4000Y
3	100	G.E.	HS	1	4800/8320Y x 120/240

CRANE & MILL MOTORS

230 V. D. C.

Qu.	H.P.	Make	RPM	Type
12	12/14	Whse.	700/600	MCA-30, Series
1	20	Whse.	975	K-5 Series
2	23	G.E.	650	MD8-406
1	35	Whse.	480	CK-9 Comp. S.B.
1	35	Whse.	480	CK-9 Sh. R.B.
1	45	Whse.	600	CK-9 Comp. S.B.
2	50	G.E.	650	COM-1830 Comp.
2	50	Whse.	525	CK-9 Shunt R.B.
2	50	Whse.	600	CK-9 Comp. R.B.
1	50	G.E.	525	COM-1830AEB.B.
1	50	Cr.Wh.	550	SW-50 Comp.
1	100	G.E.	475	CO-1832 S.B.
6	100-140	Whse.	500/415	MC-90 R.B.

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Pittsburgh Dealers Still Feel Pinch

Used machine dealers in the Pittsburgh area report slow recovery even though mills are working.

And they don't look for any solid sales until the steel strike is officially over.

■ The end of the steel strike brought an improvement that was slight and spotty for Pittsburgh dealers.

No strong, general upturn shows up in trade reports. One dealer says inquiries have picked up but orders still lag. Another sees signs that companies are starting to move on jobs that had been pending for months. A third sees no change.

Uncertainty — The uncertainty of the steel situation seems to have put the mills in a mood for day-to-day buying. District fabricators are following the lead of steel in holding off long-term programs.

"Nothing sensational is happening," says a supplier of steel mill equipment. The startup of the mills has permitted inspection of equipment. There is some buying, but major projects are still missing.

More Inquiries—Among the steel mills, interest centers on levelers, straighteners and other auxiliaries. Inquiries are coming mostly from the smaller steel producers.

This report jibes pretty well with the experience of an electrical supplier. Inquiries for electrical equipment are up. The dealer is doing a lot of writing. But orders are developing slowly.

Significantly, about 25 pct of the inquiries for electric motors are coming from steel mills. This is about the normal percentage. Despite the long shutdown and the prospect of high operating rates, mills are holding purchases at the minimum needed to sustain production.

Orders Lag—A supplier of general equipment has another slant on the same condition. He is getting orders from steel mills for shears and other items needed to fill in production gaps. Demand for tool room equipment is still lagging.

Outside steel there is a modest demand for machine tools. However, a dealer reports difficulty finding just the right lathe demanded by a customer. And there is the usual price problem.

"Buyers are still trying to dictate the prices as far as I'm concerned," says the dealer.

Handling Equipment—One of the more hopeful notes in the district is sounded by a supplier of handling equipment. He reports a trickle of new orders for large overhead cranes. During the strike and before, sales were limited to hoists and other light items for small shops. Now the dealer feels major companies are starting to dust off capital projects.

One explanation for the lack of excitement in the equipment market is offered by an electrical man. In the early weeks of the steel startup, the mills were too busy getting production started to think about anything else.

The strong push for steel is bound to generate some equipment business in the Pittsburgh district.

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10' x 10 Ga. Bertsch Initial Type
13' x 3/16" Bertsch Initial Type—New 1957
20' x ⅛" Niles Pyramid Type
32' x ¾" Baldwin Pyramid Type—New 1942
BORING MILL
Cinn.-Gilbert Horiz. 4⅛" dia. Spindle
BRAKE—PRESS TYPE
90 ton Niagara, Model 90-8-10
CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	56' 8" Span	220/3/60 A.C.
10 ton P&H	55' Span	230/3/60
10 ton P&H	39' Span	230 Volt D.C.
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Shepard Niles	36'6" Span	220/3/60 A.C.
15 ton Shepard Niles	37'9" Span	220/3/60 A.C.
15 ton Milwaukee	56' Span	440/3/60 A.C.
15 ton Shepard Niles	55' 6" Span	220/3/60
30 ton Shaw	70' Span	230 Volt D.C.
40 ton P&H	75' Span	440/3/60 A.C.
120 ton Niles	67" Span	230 Volt D.C.
120 ton Shepard Niles	77' Span	220/3/60 A.C.

DRAW BENCHES
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500 ton HPM, 14" Stroke, 28" x 38" Bed
1000 ton Southwark Bed 44" x 54", Stroke 20"
Model F-1200-42 Clearing, 30" Stroke, 42x42" Bed
4500 ton B-L-H Bed 68" x 68", Stroke 40"
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22" x 40" Lewis 3-Hi Sheet Mill
ROLLS—PLATE STRAIGHTENING
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90" McKay 9 Rolls 15" Dia. Backed-up
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125 HP, 1750 RPM, G.E. type CD 1449Y
100 HP, 720 RPM, G.E. type CD 135
90 HP, 575 RPM, West. (6) type SK 183A, dr-pf, Ball Brg.
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150 KW, 600 volts, G.E., RC 38, 1200 RPM
150 KW, 250 volts, West., 197A, 1200 RPM
125 KW, 250 volts, G.E., MPC, 1200 RPM
100 KW, 250 volts, Reliance, Ball Brg., 1050 T, 1200 RPM
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Centering Machine: 6" x 72" No. 56 Sundstrand
Chucker: 6½" 665 New Britain, 1943
Compressor: 40 HP & 75 HP I-R & Gardner-Denver
Compressor: 868 CFM Sullivan, 2 stage, 125 HP
Cutoff, No. 3 Modern, 1943
Drill, Deep Hole: No. 429 W. F. & John Barnes
Drill: 21" Cin. Bick., SS, 1L, late
Drill, Radial: 4' 11" Carlton, 1941
Grinder, C'less.: No. 2 Cintl., 1951
Grinder, Cyl.: 10" x 36 Norton type C hydr., 1943
Grinder, Int.: No. 271 Heald, 1951
Hammer: 100 lb. Murco upright
Lathe: 25" x 18' Axelson Hy. Dy. TA. 1942
Lathe: 126" x 96' cc Niles
Mill, Boring: 60" Gisholt, vert.
Mill: 5H K&T plain vert. hd., 1941
Mill, Planer: 42" x 42" x 18' Ingersoll
Planer: 66" Rockford Hydr. open side, 1941
Presses: 106 & 150 ton Nos. 56 & 57 Toledo S.S.
Press: 125 ton No. F-1125-30 Clearing crankless
Press: 110 ton No. 675B Bliss high speed
Press: 200 ton No. 795½-72 Toledo toggle
Press: 250 ton Minster & Bliss Knuckle Jt. (2)
Press: 350 ton Clearing Crankless, 1945
Press: 600 ton No. 664 Toledo coining
Press: 90 ton No. 75 Bliss Cons. Horn
Press: 150 ton HPM Hydraulic SS, 1946
Press: 350 ton Elmes Hydr., 1944
Press: 800 ton Hamilton air clutch, SS, 1947
Roll: No. 18 Kane & Roach straightener, 2½" bar
Saw: 10" x 10" Racine track saw, late
Shaper: 12 Pratt & Whitney vert.
Shear: 96" x ⅝" cap. Beatty, 1942
Shear: 38" throat New Doty, comb.
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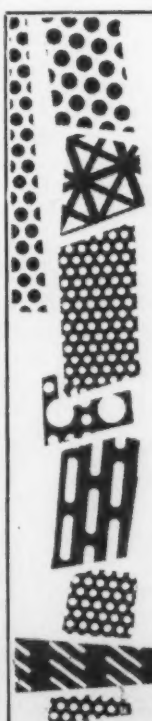

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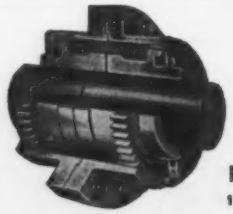

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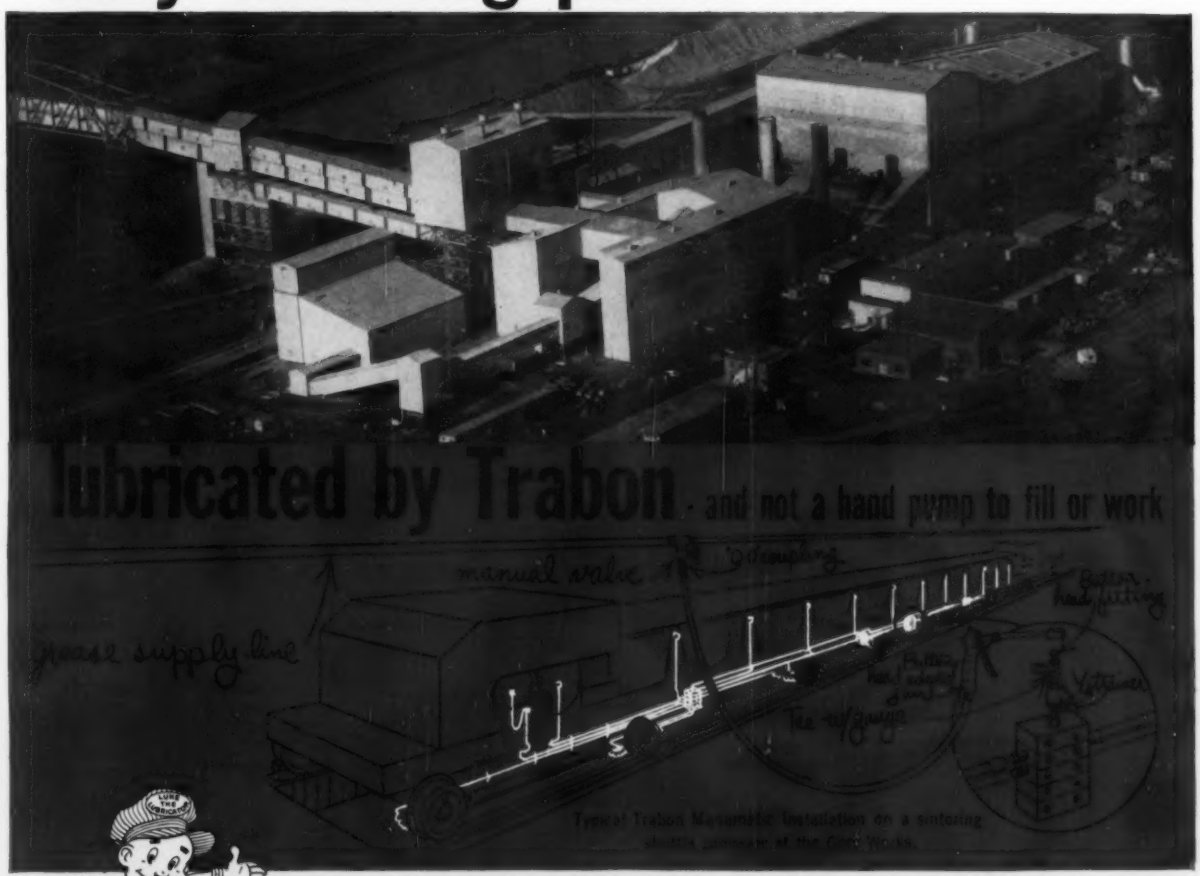

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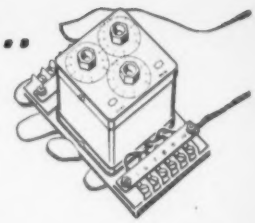
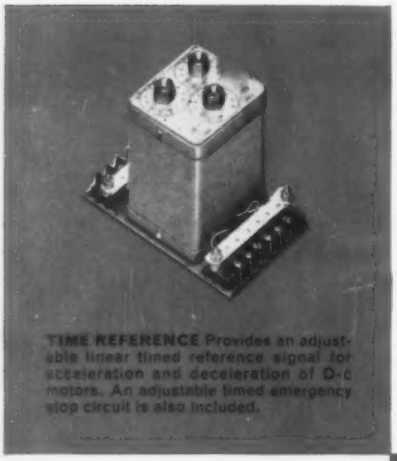
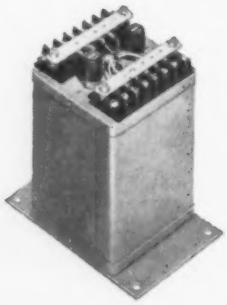




TIME REFERENCE Provides an adjustable linear timed reference signal for acceleration and deceleration of D-c motors. An adjustable timed emergency stop circuit is also included.



POWER SUPPLY Provides static power conversion of A-c line voltage into two channels of D-c, one to power other modules, the other is used as a regulated reference voltage. Available in several sizes.

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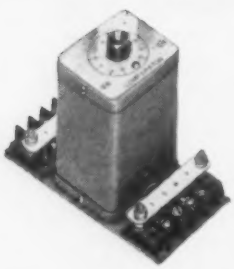
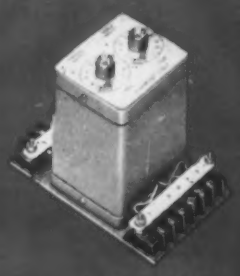
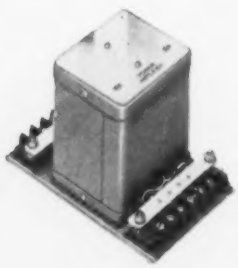


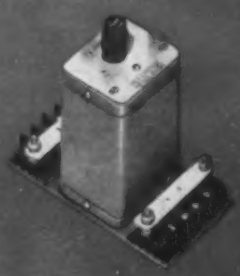
COMPARATOR This adjustable gain amplifier monitors a feedback signal, compares it with a reference input, then generates a corrective output error signal.



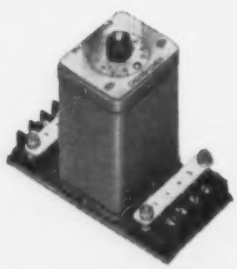
CURRENT LIMIT Designed to protect an armature circuit from over current, this module generates a corrective signal when the current reaches a pre-set limit. Current limit set point and taper are adjustable.



POWER AMPLIFIER Amplifies the output voltages from other modules when a stronger signal is required . . . frequently used as a pre-amp to magnetic amplifiers.



REFERENCE REGULATOR Converts an unregulated D-c input voltage into a regulated output suitable for use as a regulator reference voltage source.



CROSS-OVER Designed to progressively regulate both the armature voltage and shunt field excitation, the cross-over converts a single input into two output signals.

LOW LEVEL CURRENT AMPLIFIER Adjustable gain amplifier for use with low power signal sources such as self-generating photo cells.

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